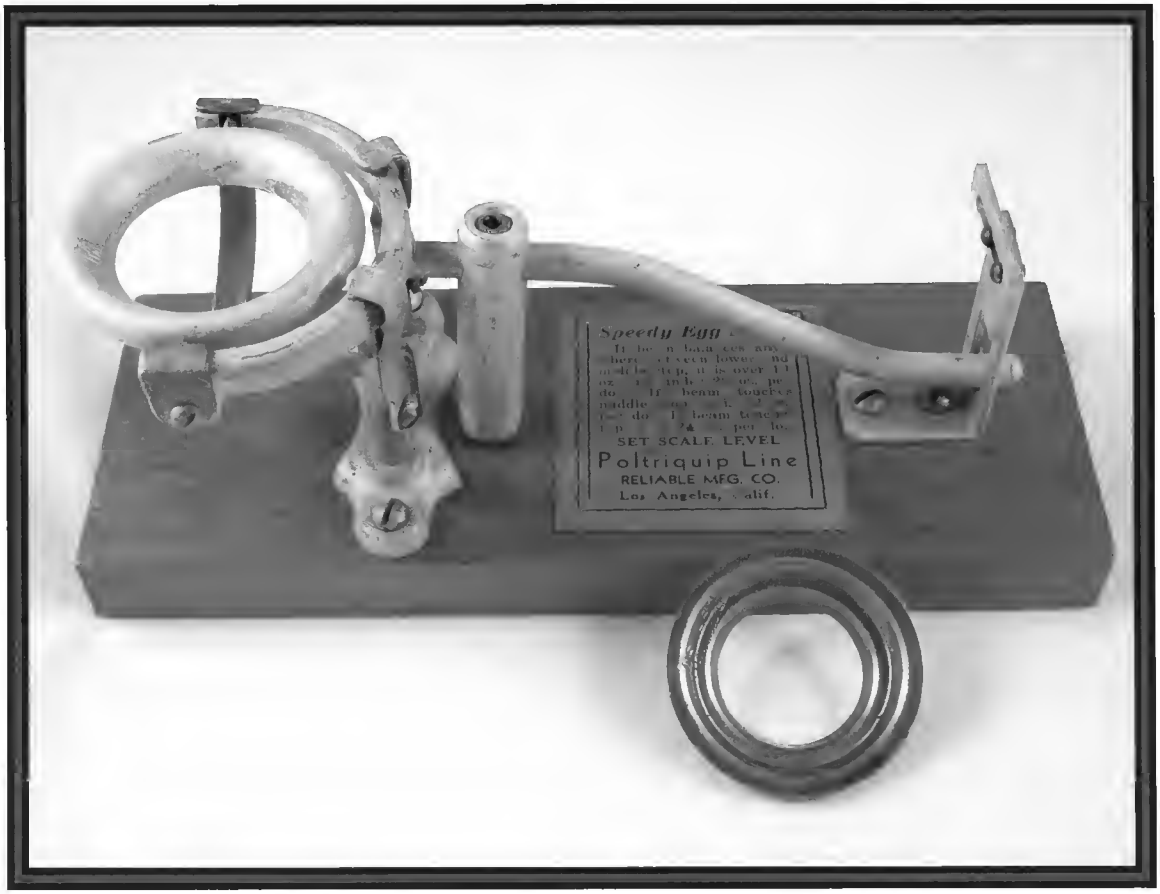
ISASC

EQUILIBRIUM®

QUARTERLY MAGAZINE OF THE INTERNATIONAL SOCIETY OF ANTIQUE SCALE COLLECTORS

2014 ISSUE NO. 1 PAGES 3993 - 4020



Cover Picture

The Speedy Egg Scale was manufactured by the Poltriquip Manufacturing Co., Ltd which was part of the Reliable Manufacturing Co. of Los Angeles, California. It is believed to date from the late 1910s or early 1920s. The wooden base measures 7½" by 2¾" and is 2¾" high. The attached label reads *Speedy Egg Scale. If beam balances anywhere between lower and middle stop, it is over 19 oz. and under 22 oz. per dozen. If the beam touches the top, it is 24 oz. per dozen. SET SCALE LEVEL. Poltriquip Line. RELIABLE MFG. Co. Los Angeles, Calif.* (NOTE: Placing the Peewee weight on the egg cup facilitates weighing (15-to-18 oz. per doz. eggs.)

Les Firth Collection.

Contents

A New Variant of the Kronenberg US CCD, Update
Michael Foster 3995

Lletjós Scales & Balances, 1860-1954
Francesc Lletjós Llambias 3996-4012

The Taxors of the University of Cambridge
Christine Biggs 4013-4018

An Early Rocker
Norman Biggs 4019-4020

INTERNATIONAL SOCIETY OF ANTIQUE SCALE COLLECTORS

EQUILIBRIUM is published quarterly in February, May, August and November.

 ISSN: 0893-2883

Article submissions are preferred in MS Word with Times New Roman Font size 12.
Photos are best in 300 DPI Jpegs in a separate file with a maximum of 3 photos per Email.

A New Variant of the Kronenberg U.S. Counterfeit Coin Detector - Update

BY MICHAEL FOSTER

In a recent article in the *Equilibrium* Issue 4, 2013, pp. 3981-86, the author stated that he would be very interested in hearing from any reader who knew where one could get photos of an example of the Kronenberg Variant 1.

Bill James responded as soon as he read the article. He doesn't have a Variant 1 but he does have a labelling variant on the newly presented Variant 2 Kronenberg rocker without gauge slots. This new rocker is Variant 2a:

Kronenberg Variant 2a

The 'a' for a differently labelled version, perhaps made slightly after Variant 2. Variant 2a has the labelling 'COIN DETECTOR' with the 'U superimposed on a reversed S', along with the 'PAT. APP'D FOR'. Variant 3 with the added coin gauge slots has the same labelling. Variant 2 without gauge slots has only the 'PAT. APP'D FOR' label.

We now have four variants of the Kronenberg rocker on record showing a design and labelling progression from Kronenberg's original filed US Patent Application No. 195,451 on a COUNTERFEIT-COIN DETECTOR on March 2, 1877.

Acknowledgements:

Special thanks to Bill James for providing a photo of his Kronenberg rocker, Variant 2a.

Lletjós Scales & Balances, 1860-1954

BY FRANCESCO LLETJÓS LLAMBIAS

TRANSLATED BY JOSEP MARIA MASFERRER BONAMUSA

Figure 1. ⮜⮜ "Isabeline" Beranger scales in a marble box.

Luciano Lletjós Serrabasa started a scales and balances factory in Barcelona in 1860. He probably came from Manresa, and became a Master of the Craft on April 10, 1867. This metallurgical craftsman, who had his first workshop at 29 Assaonadors Street and his first trade in iron beds and balances at 12 Cádiz Street, was a strange person who lived for his work. It was said that his obsession was to save money in case of an illness.

His love for the work led him to set up a communication system from the workshop at 185 Roger de Flor Street up to his apartment on the first floor of the same building, so that his wife Antònia could inform him that lunch was served and thus not waste even a minute of work. At the workshop where he used to work before he had his own, he was respected, but he stayed apart from the other workers because of his unsociability. Actually he was a perfectionist for whom nothing was well-enough done.

With such a reputation it was not surprising when the newspaper *LA FEDERACIÓN* published, on 12.9.1869, the following claim: "It came to our ears that Mr Luciano Lletjós, with a workshop at 29 Assaonadors Street, trading in balances and iron beds at 12 Cádiz Street, treats the painter and the other workers for whom he is responsible in a bad way."

During the second half of the 19th century the lack of employment and security at work led to acceptance of inadequate labour conditions and even to wage cuts with no rights except protesting. That system lasted for years, till the arrival of an improved organization of the workers' movement. Some of the first workers' fights started because of the measures taken by the employers. The working conditions and the state of rooms and hygiene were horrendous, and there were even a great number of cases of tuberculosis. With such a situation people could not expect to live for long. Although the agreed daily working hours were 11 or 12 it was quite usual to stay at work 15 and even 16 hours. It was not till 1919 that eight hours per day were agreed in Spain.

Figure 2. ➤➤ Coin scales.

Women used to be paid half the amount paid to men for the same job; children above eight could work for six hours under very hard conditions. Teenagers aged 12-18 had to work for 10 hours per day. Spain had no social laws relating to work till 1873, with the establishment of the First Republic.

On the other hand, on 20.4.1881 *EL DIARI CATALÀ* reported an invention which changed the concept of weighing with steelyards with the following comment: *New scale invention.- We had the chance to see the new system of scales invented by the manufacturer of Princesa Street, Mr. Llucià Lletjós. These scales consist of a double steelyard which needs no loose weights, and has a new lever system that provides good results. Our congratulations to Mister Lletjós for his invention.* (Text in archaic Catalan language.)

As mentioned above, the trade moved to 12 Princesa Street, later renumbered 14. The shop and offices in Barcelona were not vacated until 1954/55, when the company closed. The workshop and factories changed their location from time to time in answer to the increasing needs of production.

On 26.9.1882, *LA SEMANA INDUSTRIAL* reported that Mr. Luciano Lletjós patented his new scale: Patent granted to Mr. Luciano Lletjós Serrabasa, from Barcelona, concerning a steelyard without [loose] weights. Twenty-year patent Nr. 14.444-2.390.

Figure 3. ⅄⅄ Platform scale with platter and loose weights.

Figure 4. ⅄⅄ Equal-arm scale for 500 Kg built by Luciano Lletjós between 1860 to 1890.

In 1887, Luciano's workshop moved to 21 Santa Ana Square, in the old town, near other craft workshops.

The double steelyard was exhibited at the 1888 Universal Exhibition of Barcelona, where it was awarded the Silver Medal by the Exhibition Jury, and where the manufacturer advertised himself in the following way: *Great factory for scales, balances and all kinds of weighing principles. Patent Double steelyards, all principles of scales, from small counter types up to units to weigh carts, wagons and so on. Manufacture of beds of any kind and shape. Luciano Lletjós, authorised verifier and manufacturer.*

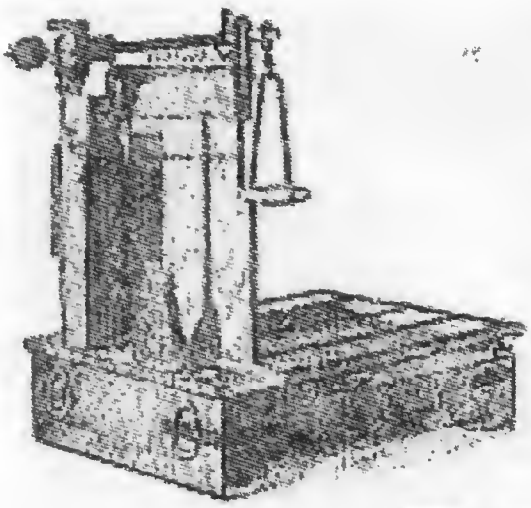


Figure 5. ≺≺ Model prior to patent nº 2390, still with a weight platter.

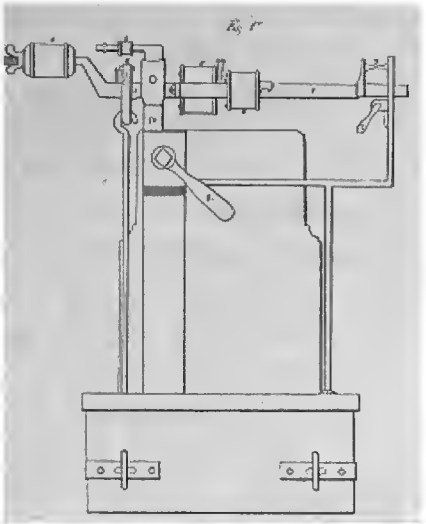


Figure 6. ≻≻ Steelyard system invented by Luciano Lletjós and awarded a medal at the Universal Exhibition of Barcelona, 1888.

Figure 7. ≻≻ 10 Kg roberval counter scale.

In 1890, eight years after the grant of the patent, the payment of its rights stopped because the system was being used by all scale manufacturers, who discontinued the use of loose weights which until then had to be placed on the platter as a counterweight. It became impossible to prosecute the infringers, because every manufacturer introduced a small change in the system.

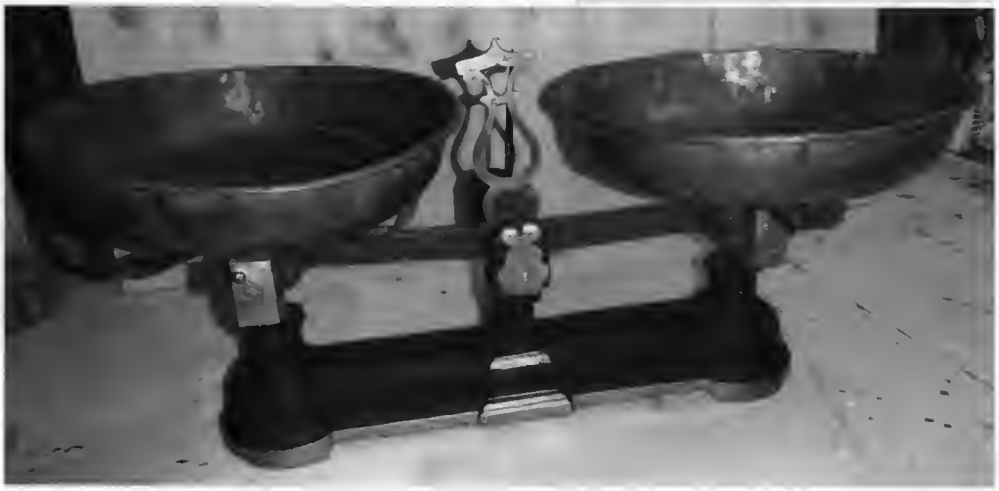


Figure 8. ≺≺ A Safe.

Figure 9. ≻≻ Brass weight manufactured by LLETJÓS. Barcelona, at end of 19th Century.

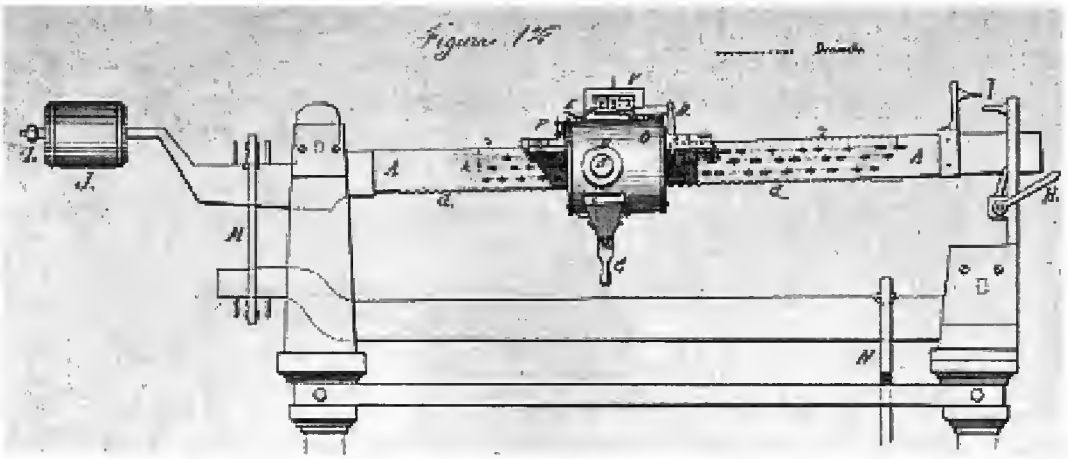


Figure 10. ≺≺ 1893 patent signed by Antonio Lletjos.

Luciano Lletjós married Antònia Ferrer, they had two sons: Antonio, born 1862, and Joaquín Mª, born 1875. By 1893, when he was 31, there was the first reference to the contribution of Antonio to the company, when he signed the patent of a *printing and dating scale, which also indicates the number of weighings.* The late incorporation of Antonio to the company, and the fact that he signed the patents from that moment till his death, suggests that he possibly received some kind of technical training.

During 1894, the workshop moved to 119 Ausiàs Marc Street, where not only scales, balances, weights and measures, but also iron beds and Safes were manufactured. Outstanding scale and balance manufacturers of that time, such as Juan Amat, Juan Pibernat and Salvador Magriñà among others, also produced such products, which had an apparent affinity with the job.

In 1898, Luciano advertised in the sections of "smiths and locksmiths" and "iron beds", he was also registered to attend the "Modern Trades Exhibition of Madrid", and expanded the factory located at Roger de Flor Street, now re-numbered 83 instead of 185 because of the urban reforms in Barcelona as a result of its expansion carried out through the "pla Cerdà".

By 1900, the company changed its trade-mark from Luciano Lletjós to *HIJOS DE LUCIANO LLETJÓS*, [LUCIANO LLETJÓS' SONS] hinting that Luciano probably died between 1898 and 1899. The business was handed to his successors Antonio, now aged 38, and Joaquín María, aged 25, about whom nothing is known in relation to the company, as the new patent granted that year for *An instrument consisting in iron weights with a system to keep them accurate* was signed by Mr. Antonio Lletjós Ferrer only.

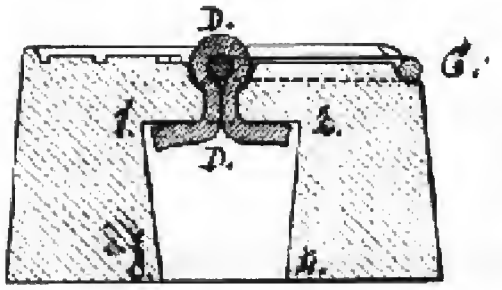
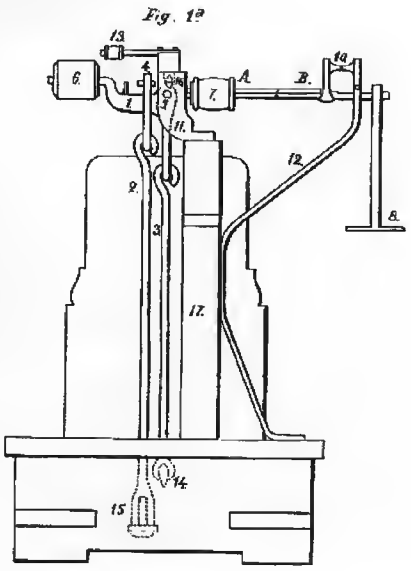


Figure 11. ≺≺ Iron weight with a system to keep it accurate, invented by Antonio Lletjós Ferrer

Figure 12. ≻≻ An economic scale patented in 1903, which was not manufactured.



In 1901, Antonio Lletjós Ferrer asked for permission to set up an engine and a pit for casting iron, as an expansion of the workshop still at 117 Ausiàs Marc St, and which adjoined the factory at 185 Roger de Flor St, where simultaneously two new forges were to be installed. Joaquín Maria was still not mentioned in the patent granted in 1903, although Antonio signed one concerning *An economic scale.*

After the acquisition of ground at 236 Dos de Maig St., they built their first purpose-built factory – although the permission for the project, in 1906, was for a *shed with façade*. Two forges were installed there, and the electrical motors replaced by a *silent five horse economical gas driven OTTO engine, with a consumption of 2 to 3 horse-power.* All management of building works and machinery transfer from Roger de Flor was done by Antonio Lletjós Ferrer.

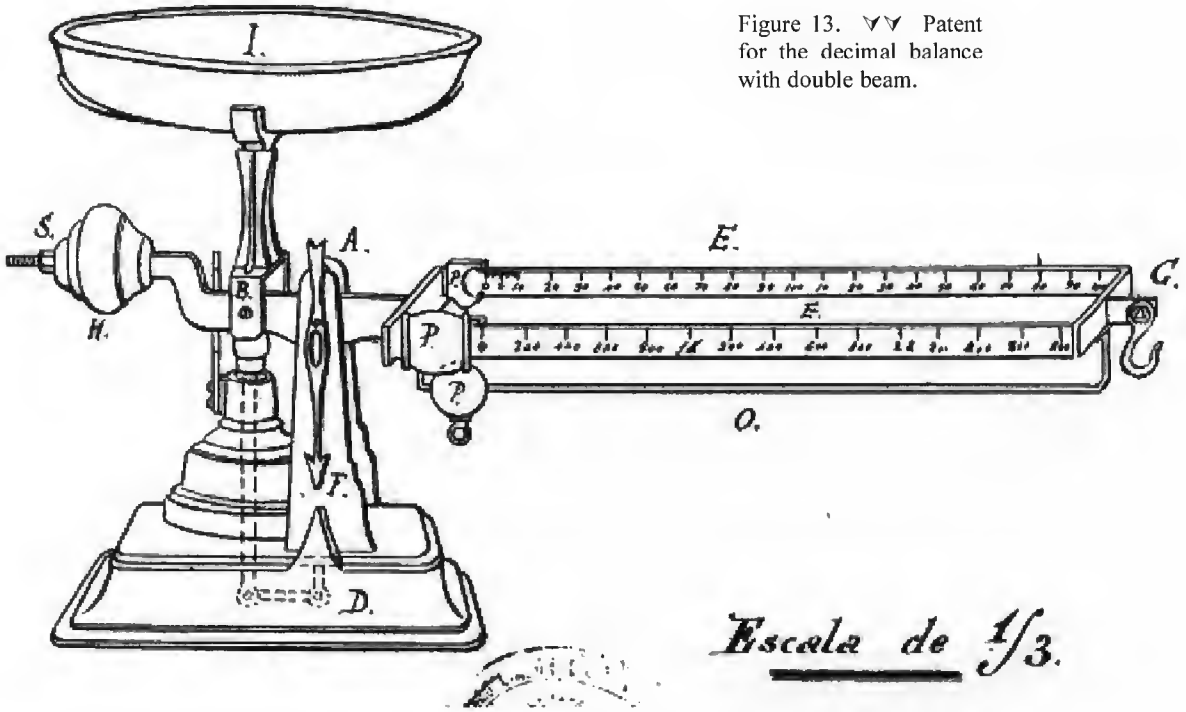


Figure 13. ⋎⋎ Patent for the decimal balance with double beam.

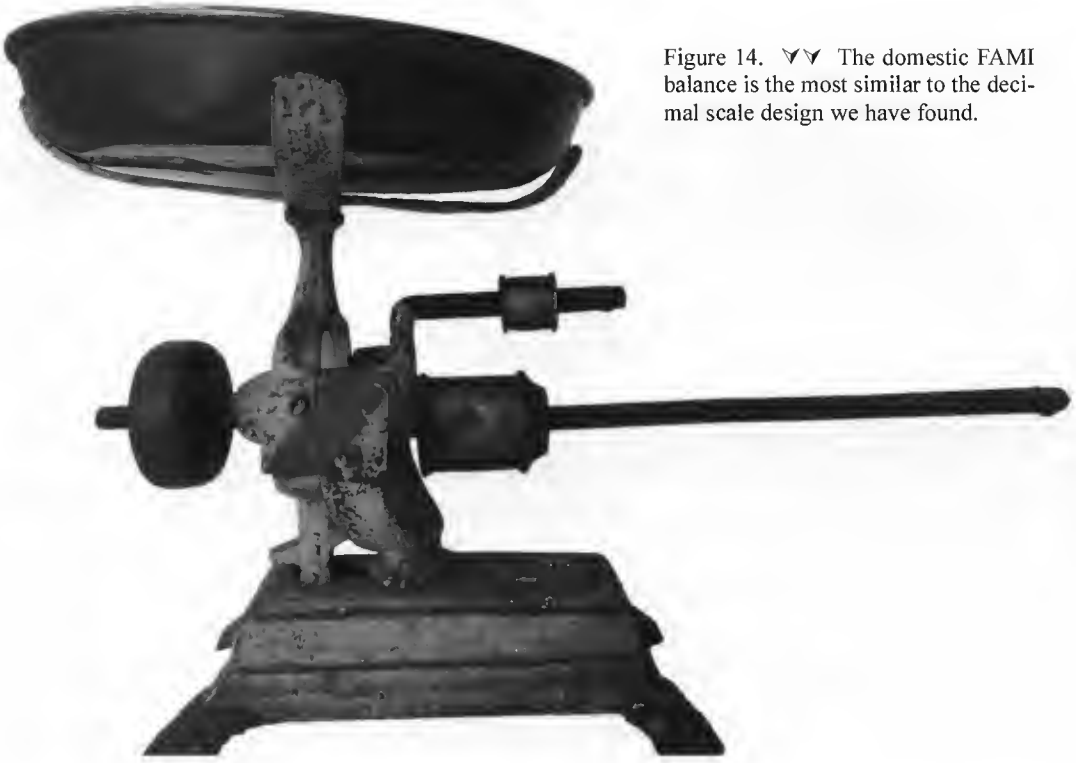


Figure 14. ⋎⋎ The domestic FAMI balance is the most similar to the decimal scale design we have found.

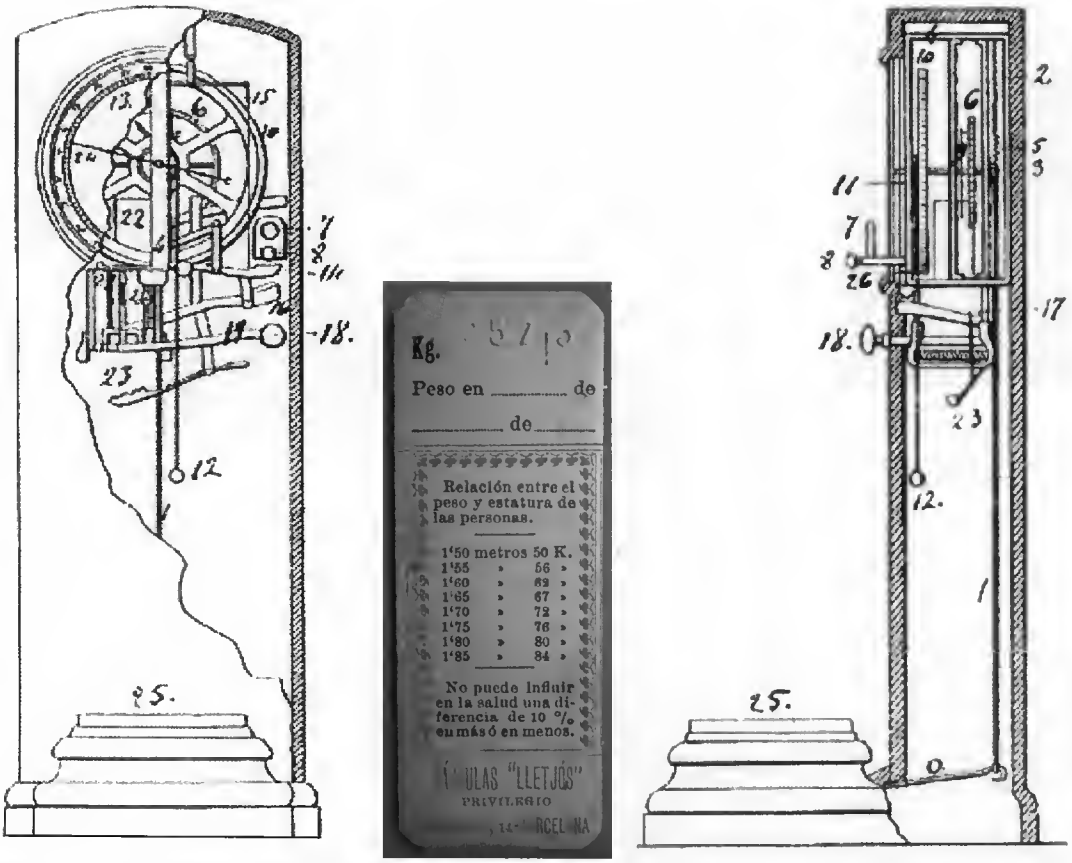


Figure 15. ⅄⅄ Automatic printing scale design. The weight of the person was recorded by inserting the card and pressing the lever.

It was not till 1908, when a Decimal scale was patented, that we find the intervention of Joaquín María, who was already 33. This was not an Invention patent, but an Introduction one, which meant that the item had already been patented abroad and that the company was the first to adopt the system in Spain.

During 1909, two inventions were patented by both brothers: An *economic scale* early in the year and *An automatic printing scale* at the end of it.

This was the heading of the company bills by 1910:

HIJOS DE LUCIANO LLETJÓS.

Scales, balances, weights, Safes etc.

Speciality in carts and wagon weighing.

Patent printers.

Fireproof Safes for documents and company books

Figure 16. ⅄⅄ Brass weights by Lletjós.

In June 1913, the Social Reform Board filed the regulations of the company Hijos de Luciano Lletjós. Until then, every company had its own specific rules concerning workers' labour conditions, which in most cases were abusive and blatantly biased towards the owner's interests. The Social Reform Board, started in 1903, tried to change the workers' living conditions. However, its effectiveness was slight, for the bourgeois class was too powerful. The Board, on which the Law of 1900 con-

Figure 17. ≺≺ Iron ring weights by Lletjós

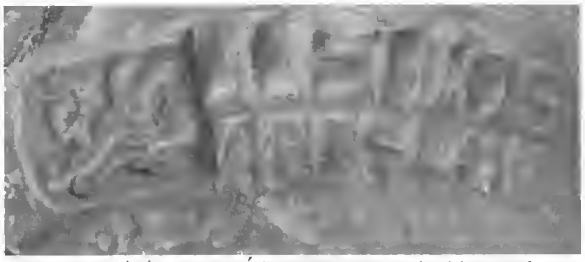


Figure 18. ⩓⩓ LLETJÓS ARENYS-marked brass pieces.

ferred enforcement functions, only managed to enforce provisional rules in most cases. The Board was disabled by the collusion between employers and local authorities.

The factory at Dos de Maig Street was upgraded in 1914, when an upper floor was built. The façade acquired an imposing look, and the top of every shed was expected to be adorned with plants. Those ornaments, however, never appeared, because, in the owner's opinion, in winter the plants would die and in summer they would be hidden by the trees' leaves. He certainly did not like to spend money!

At the beginning of 1916, a strike against the rise of the cost of living was reported, but the Lletjós workers did not support it. On 18.12.1916 the unions UGT and CNT called a general strike for 24 hours. In August a revolutionary general strike was called for all industrial centres of the country; its repression resulting in 43 deaths in Catalonia.

On 28.12.1917, the following (and surprising) piece of news was published by the Madrid newspaper *LA ACCIÓN* of Madrid: *SOCIAL INFORMATION – Compulsory strike. A workers' commission visited the Governor of Barcelona to ask his intervention in the compulsory strike imposed by the owners of the Safe fac-*

Figure 18. ⩓⩓ Fan scale by Lletjós.

Figure 20. ⩓⩓ Wooden platform scale by Lletjós.

Figure 21. ≺≺ Roberval counter scale by Lletjós.

tory Lletjós & Co., which has dismissed up to 80 workers by pleading that the locality needs refurbishment, a reason which the workers do not believe

Moving production offshore had not been invented then, but about the beginning of 1918 the factory was moved to Arenys de Mar in search of a place with less social agitation and less economic and labour aspirations on the workers' side.

Why Arenys? During that period labour conditions and wages in the villages outside Barcelona -but not very far from it- were very suitable for the employers. The Maresme district was well-known for its textile production and its metallurgic workshops that were quite often devoted to the construction of textile machinery. It meant that the search for mechanical workers was not likely to be difficult. Also the location (alongside the road and near to the railway station) was very suitable from the logistic point of view.

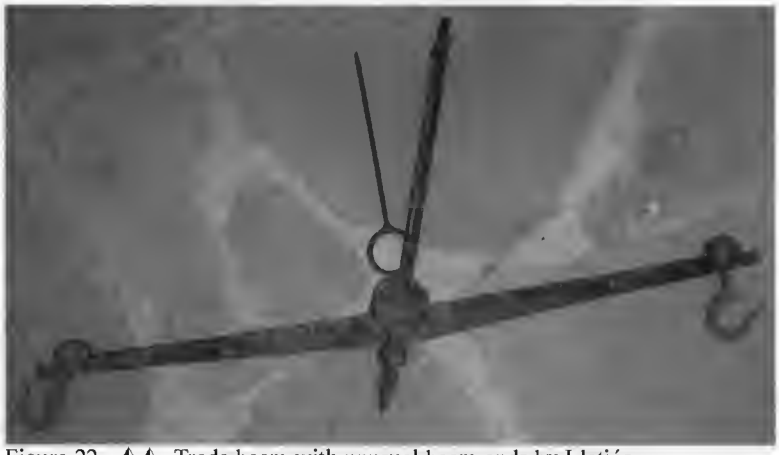


Figure 22. ⩓⩓ Trade beam with unusual beam ends by Lletjós.

Lletjós' connection with Arenys de Mar developed some years earlier, as Joaquín Mª Lletjós Ferrer used to spend his holidays there with his family, where he owned a house and a boat.

An article in the magazine *Arenys i sa Comarca* in March 1920 demonstrated how happy Lletjós workers were with their employers. The article related to the unrest and social struggles at that time, but it indicated that this was not affecting the Arenys based Lletjós factory, which gave work to a lot of people and brought welfare to many families. A commission of workers attested to the improvements introduced by their employers by quoting the following: increase of wages three times in a year without a prior demand by the workers, reduction of weekly working by two hours, grant of a Monte-Pío (sort of community pawnshop) administered by the workers themselves with funds provided by the employers, and lastly, the plans for a cooperative and pension provision under the patronage of the owners.

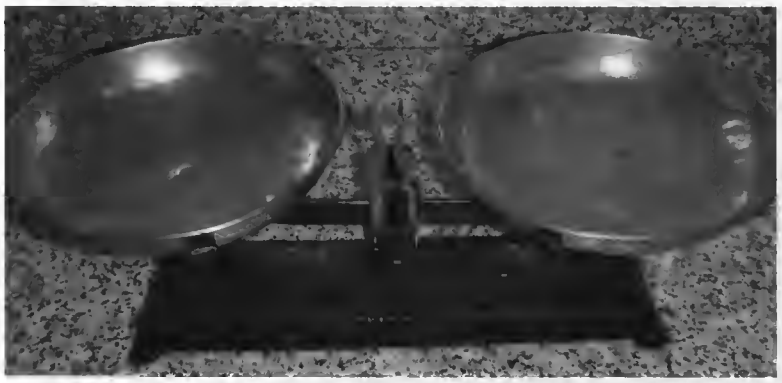


Figure 23. ⩓⩓ Model "SIMPLEX"10 Kg. (Its price in the 1940s was 50 Pta).

The article ended with the following sentences: *How glad we feel, echoing what has been witnessed by the workers of Mr. Lletjós! And by congratulating them for finding such employers; we also congratulate Mr. Lletjós for solving, in such a good way, the problems in their factory. And may God allow these streams of such good sympathy last forever among all, since that will be a pledge of everlasting peace and durable calm.*

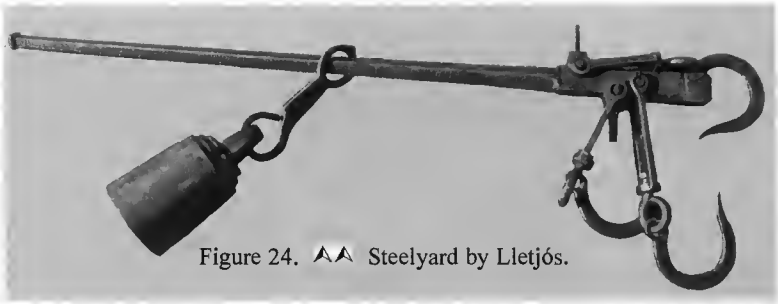


Figure 24. ⅄⅄ Steelyard by Lletjós.

Figure 25. ⅄⅄ Another roberval counter scale Euerza model by Lletjós.

We cannot assess whether the arrival in Arenys resulted in an increase of company profits, because data are not available. But we do know the factory yield per year: 40.000 Pta in 1921, according to a document written the day that Antonio Lletjós Ferrer announced the marriage of his daughter Mercedes Tarragó to his son, Antonio Lletjós Sala.

On 17.1.1921 ABC from Madrid reported on the difficulties experienced by the metallurgical industries in the area of Catalonia: *There is an increasing number of unemployed workers in the region; from Arenys de Mar it came to our ears that many workers have been dismissed from the scale factory of Mr. Lletjós, among others, due to the lack of work.*

As far as the labour conditions of the working classes were concerned, two important achievements were recorded that year: The setting-up of workers' retirement plans and the Occupational Accidents Act. Gradually steps were taken for the improvement of workers' rights.

On 12.5.1922 Antonio Lletjós Ferrer died, (the elder son of Luciano) at the age of 60. The owners of the company *Hijos de Luciano Lletjós* would now be his brother Joaquín Mª Lletjós Ferrer, 47, and his widow Luisa Sala Jambrú, 49. It was not until the death of the latter in 1942, at the age of 69, that his son Antonio Lletjós Sala entered the company, which thenceforth acquired the name of *LLETJÓS S.A.* and comprised the uncle, Joaquín Mª Lletjós Ferrer, 67, and the nephew, Antonio Lletjós Sala, 47.

Figure 26 ⅄⅄ Steelyard poise.

Figure 27. ⅄⅄ The manufactured products always showed the mark LLETJÓS – ARENYS so the name of the town was spread all over the Peninsula.

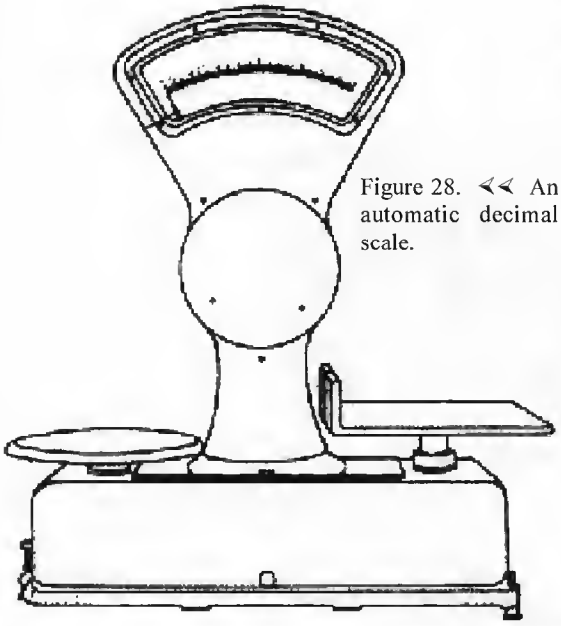


Figure 28. ≺≺ An automatic decimal scale.

Antonio had been living in the centre of Barcelona although he owned a chalet in the Horta neighbourhood (the reason being, it seems, that the air was healthier there during the flu epidemic which affected the city in 1913). From the time of his death the company patents and projects were signed by Mr. Ramon Sanuy, even if the applications was made by Joaquín María Lletjós on behalf of *Hijos de Luciano Lletjós*.

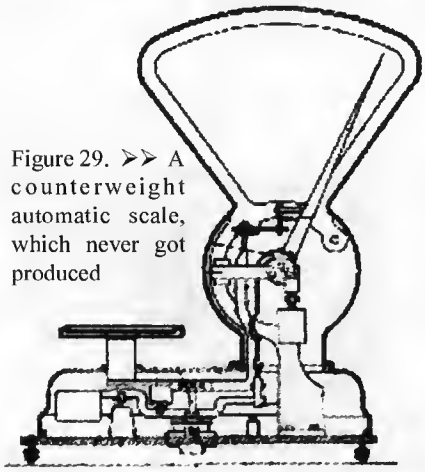


Figure 29. ≻≻ A counterweight automatic scale, which never got produced

During the years 1927 to 1929, and as a member of the *Unión Industrial Metalúrgica*, several new inventions were patented, such as: *A decimal automatic scale* (invention), *A counterweigh automatic scale* (introduction), *An automatic balance* (introduction), *An automatic scale* (invention) and *An automatic scale* (introduction). This latter patent was the basis of the mechanism of the Princesa model, which was not manufactured until 1944, fifteen years later.

Once the social troubles of the 1920s were over, the company regained its competitiveness between 1932 and 1936, though later on the agitation came back.

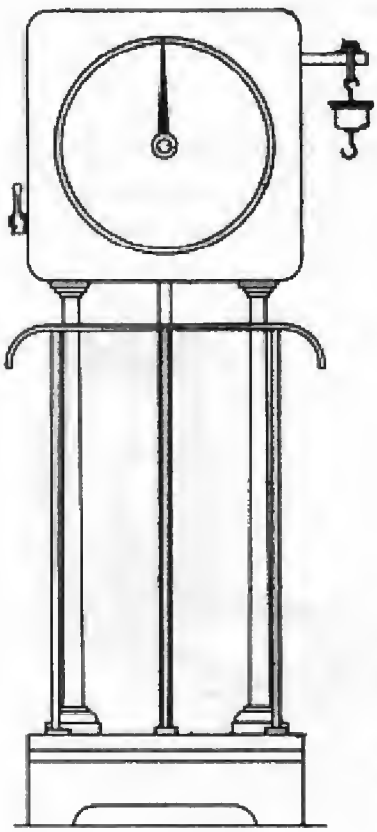


Figure 30. ≺≺ An automatic scale which was manufactured.

Figure 31. ≻≻ The project of An automatic balance, very different from the item which was finally manufactured.

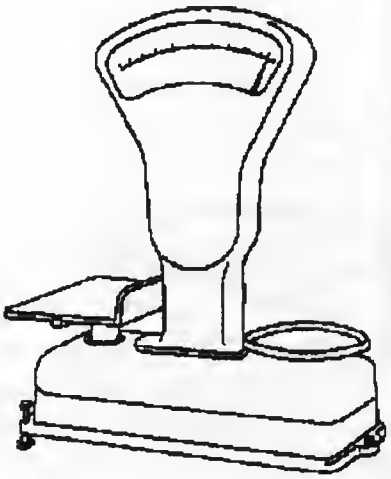


Figure 32. ≻≻ The final version, its name was "SATAM", nobody knows why.

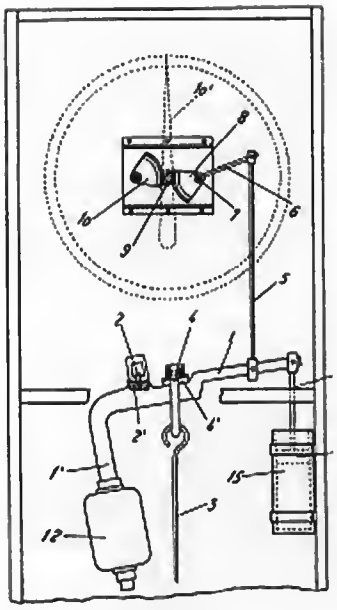


Figure 33. ⅄⅄ Patent of the Princesa mechanism in 1929.

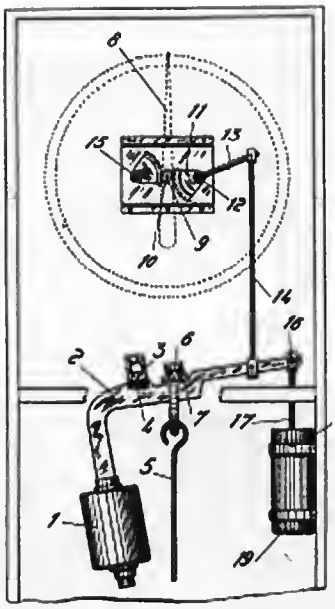


Figure 34. ⅄⅄ Princesa mechanism in 1932.

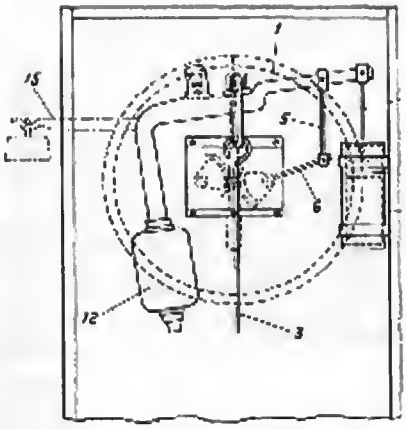


Figure 35. ⅄⅄ Princesa mechanism finally built in 1943.

As stated above, the offices were located at 14, Princesa Street till the last days of the company. The affectionate relationship with that street was evidenced when in 1930 the name Princesa was patented as *a trade mark to distinguish scales, balances and weighing instruments in general. Class 70.*

On 14.4.1931, the company LLETJÓS was registered at the Weights and Measures Office in Paris. At the end of that year a new invention consisting of *A folding scale system with extendable platform* was patented, but it was never manufactured.

On 8.9.1931, El Diluvio – Barcelona published the news concerning the massive dismissal of workers of the company Lletjós in Arenys de Mar, amongst information about other labour conflicts in that town. The beginning of the Republican period was not full of optimism and hope for everybody.

***ARENYS DE MAR**, DISMISSAL*

Last Saturday all the workers at the scale factory established in our town by the family Lletjós were dismissed. Such dismissal, for reasons are unknown to us, affects around seventy workers. We strongly desire that the grounds which precipitated such a decision will disappear, since otherwise the lack of work, already untenable in our town, will get worse.

CALL FOR A STRIKE

The workers of the local glass factory Navarro & Barrera are on strike, for the owners could not accept the demands for a wage rise. Because of the magnitude of the conflict we also hope that an agreement will be reached, and that common interest and coexistence will be set above mere useless personal disagreements.

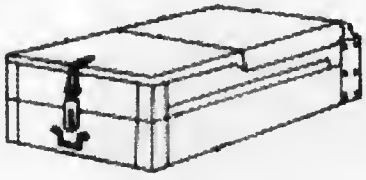


Figure 36 ⅄⅄ A set of a folding scale system with an extendable platform, shown closed, never manufactured.

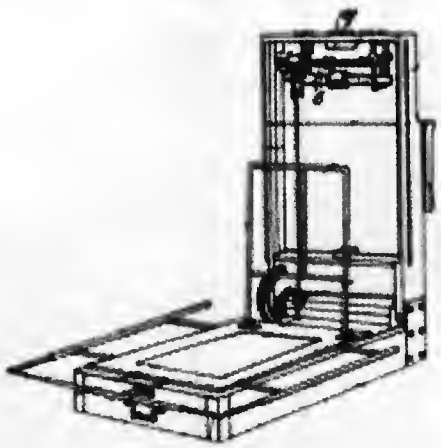


Figure 37. ⅄⅄ The extending platform shown pulled out.

ABOUT THE GENERAL STRIKE

On Saturday almost all workshop and factory workers,who last Friday stopped as a response to the Unions call for strike, resumed activities. No incidents have been reported.

SUSPENSION

In regard of abnormal circumstances, the entrepreneur of Sala Mercè Theatre has decided to suspend the performance of the lovely operetta "Marina" until next Saturday 12th.

During 1932 several advertisements referring to *Lletjós automatic scales* as *five times cheaper than imported ones* appear in *La Vanguardia*: This same year the mechanism of Princesa scales was patented again, since the previous patent had expired because of the lack of payment. This time it was an Invention Patent.

The labour situation was very difficult during the months after the proclamation of the Republic, as witnessed by the notices published by *El Diluvio – Barcelona* from June 2 - August 2, 1932: There were two months of strikes by the Lletjós workers in Arenys de Mar, according to an article that appeared in *Solidaridad Obrera* a few days before the beginning of the Civil War (1936) and the workers did not obtain their salary increase because of *the miserliness of the bourgeois Lletjós*. These are the terms he uses to express it: *... It is not the first conflict in that company. Four years ago the metallurgical workers, after several weeks on strike, did not manage to overcome the resistance of the bourgeois Lletjós to a rise in the paltry wages, to compensate for the increase in the cost of living and to equate the wages with the ones governing the same jobs in Barcelona.....* Bear in mind that in 1932 the daily salary of a metallurgical worker was fifteen peseta in Barcelona, while in the Maresme district it hardly amounted to eight or nine.

There followed, during the two-month strike, several articles in *El Diluvio*, praying for a solution.

ARENYS DE MAR *-The struggle started so many weeks ago in the scale factory has been solved. Normal activities have been restored, and we congratulate those involved in the situation.*

The month of July was a restless one in 1936. On the18th the Fascist insurgency was defeated in Catalonia, but it succeeded in other territories of the state and the civil war got started. In August a compulsory Union affiliation decree was issued, and in October the Collectivisation Act saw the light. The Lletjós factory was thus handed to the War Industry Commission of the Generalitat. In Arenys in the days before those events, people had their own troubles. On 5.7.1936 *La Vanguardia* published an article with the following headline: *THE GENERAL STRIKE IN ARENYS DE MAR IS EXPANDING. The general strike called here yesterday in solidarity with the workers of the Lletjós factory, who have been maintaining a struggle for three weeks in response to the rejection of their demands, went on today and extended to the peasants, glass industry and partially to transport and dyeing sectors. It has also affected the works on the piece of beach where one of the tents intended for the celebration of the next festivals had to be placed. The strike, lead by some CNT affiliates, has also been followed by members of UGT and UTC. No constraints or incidents have been reported, and the conflict has taken place peacefully."*

The same day *La Publicitat* reported that Mr. Barrera made a comment *...about the strike in the metallurgical industry of Arenys de Mar,... that there had been a meeting, but no agreement had been reached because the employers' representatives were not allowed to take decisions on certain points,... As soon as the struggle of the Lletjós Company is resolved the work will be resumed.*

During 1936 the trade mark *Lletjós* was patented, in order to distinguish scales, balances and weighing instruments in general.

On 7.7.1936 *Solidaridad Obrera* (Organ of the Workers' Regional Confederation of Catalonia – Voice of the Worker's National Confederation of Spain), published an article with the following heading: *THE RAPACITY OF THE BOURGEOIS PROVOKES A GENERAL STRIKE. – WHO ARE THE TROUBLEMAKERS? The rapacity of the bourgeois Lletjós, from Arenys de Mar, has resulted in the general strike in that locality. The*

strength with which the struggle is maintained by the comrades in that company has corresponded with the solidarity of the entire working class, which is not willing to accept a heartless bourgeois making a great number of workers become slaves. This was an unpleasant article which left Mr. Lletjós in a very bad position; it reminds us also of how the factory came to Arenys, that is, to pay lower wages than in Barcelona ... in a mysterious way and without prior notice they pulled out the machines and moved them to Arenys de Mar.

On the same day La Vanguardia reported that the strike was over: "The strike called last Friday in Arenys de Mar in solidarity with the workers of the factory Lletjós has been solved, and the strikers have resumed work.

Once the war started, the factory was seized by the Government of the Republic with the aim of placing there the metallurgical defence industry of the Maresme district. It produced 81mm mortar shells ordered by the War Industries Commission; it was the first time that such missiles were manufactured in Catalonia.

In 1937, under the name Mechanical Co-operative Industries of Arenys, the factory paid 116 salaries for a total amount of 11.620 Pta. The monthly mortar shell production was of 2,055 units. They were manufactured using Siemens steel and brass, and the weight per unit was of 3.600 g. The bomb fuses, the bait holders and other pieces were manufactured in other workshops, and the final assembly and load were made in CIG's factory number 11 (CIG: War Industries Commission)

In a program broadcasted in 2007 by TV3, Eliseu Lázaro, a lathe operator in the Lletjós factory during the war period, explains the manufacturing of mortar shells and how the factory was operated:

They were pieces we could produce with the machines, no problem; they were 81mm mortar shells. We had the plans and some sample pieces and we kept working there. There were people coming from trades without much technical knowledge, but they practiced and this made them effective; people worked. We missed somebody managing the whole thing; somebody, say, or better a team than a person, it's always better a team than a person, a good team able to rule all that. We were not convinced that everything would go well. But things were well done, for sure.

That's the way that Lletjós Scales, as well as other workshops which were not well known to the enemy, were finally identified and became specific targets of Fascist bombings. This is the state of the affairs in the factory of Arenys: *ARENYS DE MAR. 81 mm mortar shells production keeps going on, as it used to happen before. From this month's 17th day it is stopped due to lack of materials. The payroll amounts to Pta 11.620. The monthly production is 2055 shells.*

From the book *Arenys de Mar 1920-1960*, written by Mª Pilar Royo Magallón, we can extract the following: *THE INDUSTRY* ***Before civil war (around 1931)*** *The road ran alongside the railway and next to it, on the left, there was a big factory called Lletjós, which was the brand of scales they manufactured; those scales used to weigh potatoes, tons of them, or those manual ones used by itinerant fishmongers and with the weights like this, or still those others on a tall pillar, of one and a half metres or so, on which the scales were hung, because if they had to put eighty kilograms on the scales nobody could hold them up... They were scales manufactured in Arenys, their factory was called Scales because they produced Roman Scales [steelyards], they made the ones with the platters, they made those.*

After the war. *With respect to techniques, after the war they started to introduce double-cylinder machines, and there were many fitters who got started without attending specialized schools. "Well, my father had a small workshop. He did everything, he was a mechanic. Everything was done, but mainly textile machinery; this was his speciality, which he had learnt outside, because my grandfather was a blacksmith... Much had been done here at home, very beautiful things"*

Figure 38. Scale "*Princesa.*"

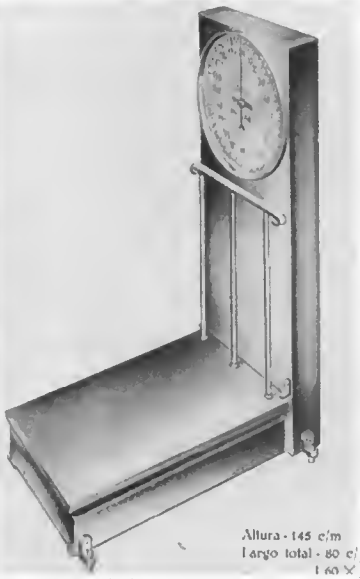


Figure 39. Sales brochure.

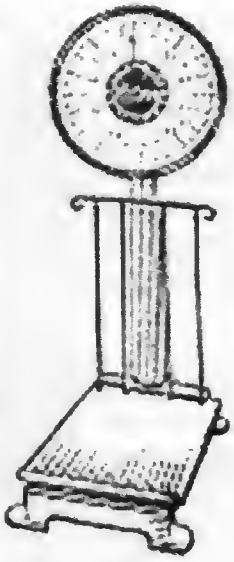


Figure 40. The catalogue illustration of the Princesa.

Figure 41. Unit restored by Manuel Plens and Manel Inard, displayed in Calisay building, Arenys.

"Let's go to Barcelona", and we went there ... in Horta we were recommended to mister Lletjós. My father was very clever, and mister Lletjós had a factory in Arenys... Scales, there where they manufactured scales they make pharmacy lancets now: There all your sons will have a job, and they got it, the boys were older, they got a job in Arenys all three, in the scales.

Once war was over the company was handed back to the Lletjós family, and the scales and balances manufacture was resumed. During some years the level of production was remarkable, probably because all that had been destroyed during war needed replacement. But the models in production were not renovated, and the other manufacturers did not forgive. Regarding the post-war labour situation, it was calm under Franco's regime. Little money and fewer complaints...

Things happened in the industrial world that could be qualified at least as peculiar. On 10.4.1940 La Vanguardia published a list according to which *Hijos de Luciano Lletjós* employed two new workers, by decree. The text said: *CIVIL GOVERNMENT Workers' employment. List of companies and workers employed by them, in answer to the initiative of H.E. the Civil Governor to commemorate Victory. Barcelona city (third listing) .... Hijos de Luciano Lletjós 2;.... and in July 1941 the Law of Basis of the Vertical Syndicate was established to compel membership of the Unique Union.*

Mª Luisa Sala Jambrú died in 1942. She was Antonio Lletjós Ferrer's widow, Antonio Lletjós Sala's mother and Joaquín Mª Lletjós Ferrer's sister-in-law. She had inherited a part of *Hijos de Luciano Lletjós* on her husband's death (1922), although it was managed by her brother-in-law. After her death his elder son Antonio became a partner in the company.

Taking into account the disadvantageous situation in the domestic market and the loss of competitiveness originated by the stagnation in innovation experienced after the end of the war, the decision was made to manufacture and commercialize the 1944 PRINCESA scale model, in versions of 50, 100, 200 and 500 Kg. Its introduction patent existed from 1929, and it was patented again on July 3rd 1943 with Nr. 162.431.

The first units of the model were made of wood and had a large dial. Later on it was entirely made of cast iron. At the Calisay building, Arenys, a unit of each type is displayed. The wooden PRINCESA was donated to the Council in 2003; the metallic version was still working at the liquor factory in its last days. The Princesa scale was also sold for use in a pharmacy. The launching offer was apparently quite good, since the advertisements showed a price of 1.450 Pta. Two months later the introduction was over and the price rose to 1.600 Pta.

On 9.1.1944 *LA VANGUARDIA* had an advertisement for AUTOMATIC LLETJÓS SCALES Don't be exposed to mistakes and waste of time by weighing with old devices. Use a modern one and you will obtain rapidity and precision If you acquire it you'll defend your interests and you'll weigh with rapidity and precision.

A strong feature of the company was that it manufactured not only industrial scales but also balances for shops, from the models with platters to the semiautomatic and even automatic ones. We can find two good examples of counter scales in Arenys: one in the almond shop Cal Joan in Avall St., and the other in the food store Can Nogueras, located opposite the church.

Figure 42. ⅄⅄ The Princesa scale was also sold for use in a pharmacy.

Figure 43. ⅄⅄ A later, heavy duty cast iron model Princesa.

Figure 44. ⅄⅄ Advert in LA VANGUARDIA. January 9th 1944.

In 1945 there was an attempt to expand the market to the Spanish capital, but it seems that Madrid was not the solution to the problems yet to come. We can read a demand for an EXCLUSIVE AGENT inserted in the newspaper ABC. Wanted in Madrid and province by the old-established company Lletjós, for the sale of its new models of automatic scales, with strength from 50 to 300 Kg, very economic, precise and well accepted in food stores and shops of all kinds. Apply to: LLETJÓS S.A. 14, Princesa St., Barcelona.

RENFE acquired some PRINCESA scales for the freight department of the Maresme district railway stations. They were used for parcel weighing, since at that time the train was the usual way to carry low-weight merchandises from town to town. By the eighties that was fully replaced by road freight.

Figure 45. ⅄⅄ A second advert in LA VANGUARDIA. March 21st 1944.

Figure 46. ⅄⅄ Can Nogueras.

Figure 48. ⅄⅄ Cal Joan.

At the beginning of the 1950s the company started to fade. It still kept running for some time, but the lack of updating in the production (obsolete machinery, too much labour), the scarce or nonexistent investments in new product and technology at the required moment, and some family frictions (too much difference of age between both associates, a too-conservative view of the business from Joaquín Mª –whose character was stronger -, and a too-accommodating and respectful personality in the case of Antonio –who had been too many years the representative of his mother in the company, and who had been manipulated by her) resulted, in 1954, in the bankruptcy of the company, with a significant debt accumulated in its liabilities.

Antonio Lletjós Sala was the managing director, and hence responsible for the company. So, after big efforts to resist for some time, he had to start selling his personal assets in order to be able to pay the debt owed to the suppliers, workers and Administration.

Antonio Lletjós Sala died in 1962 at the age of 62. He had married Mercedes Tarragó Jambrú, who gave him five children. They kept on living at Roger de Flor St, in the house which had belonged to his grandfather Luciano and his father Antonio, until the failure of the company. He played football in the RCD Espanyol (it seems he was one of the founders of the club), and in the second half of 1920 he played in the Gràcia. At the beginning of the civil war a hot-headed group of workers fetched him from his home. As he was not there they tried to kidnap his youngest son, who was two, till the appearance of his father. The toddler was hidden inside a laundry basket by the housemaids. Finally good sense prevailed and things did not go further. Family Lletjós Tarragó spent the summers in a hired house of El Masnou, and they owned a chalet in Horta.

He always let his mother (Luisa Sala, who was, it seems, a quite smart woman) give him advice about factory matters and how to deal with his uncle Joaquín Mª. However, it is easy to imagine that he could not manage the affairs as he would have liked to: He did not enter the company till the age of 42, his mother's advice was always present and his uncle, 25 years older than him, had his own ideas and was very much used to being the boss...

A last attempt to save the company was made by his son Antonio Lletjós Tarragó, who had worked alongside his father during the last years. Later on he also got the help of Francisco, his brother, but the results were not positive at all. Once the company had been dismantled Antonio Lletjós Sala leased a workshop next to Centre Square, in Barcelona, and got installed there together with his son Antonio with the aim of constructing and repairing scales and balances. But what happened was that they finished by producing a motorcycle, which they branded "HURACAN". They manufactured just a few units, and some raced at the circuit of Montjuic. The factory, which was a company asset and hence belonged also to the uncle, was sold to one Mr. Sentís who, it seems, went on manufacturing scales for another five years, presumably with some of the older workers and possibly with some participation of the sons of Joaquín Mª and some other people of the Catalan bourgeoisie. This is how LLETJÓS S.L. was created.

The shop located at Princesa Street was shut down and Paco Lletjós Aragonés, son of Joaquín Mª opened a new one in association with A. Girós, who most probably had been working with him in the old shop. Joaquín Mª Lletjós Ferrer died in 1956 at the age of 81. He had been a man of strong character, as proved by the number of labour struggles he had to face during the years he was the head of the company and the tough decisions he had to take in the workless periods, among many other circumstances. His personality led him to be the chairman of the guild of scales and balances manufacturers during the 1930s. He married three times and had seven children. He lived for many years in Horta (near Barcelona); and during the 1920s he was a member of the "Somatén" (local volunteer militia), where he had the rank of corporal and was awarded with the first class cross of Military Merit. As we said above he owned a house and a boat in Arenys de Mar, and this was one of the reasons for the installation of the factory in that town. Regarding the industrial aspect, it is obvious that he lived very well by manufacturing the same things for years and years, without much innovation... If money was flowing, no need for investments. During the entire civil war, as he failed to escape to Mallorca, he was hidden somewhere in Barcelona. Paradoxically four of his sons had to fight in the Republican Army; the youngest one was recruited at the age of seventeen.

On 25.4.1958, two years after the death of Joaquín Mª, the following advert was placed in La Vanguardia by Ausencio García Galarza, the secretary of the local Court: Arenys de Mar, factory known as LLETJÓS scales, measuring 80.000 spans, with house and sheds. Between road and station. Yields 4.000 Pta per month and is partially free of renters. Price 750.000 Pta, to be discussed. Contact my administrator, Mr. García, Ph. Nr. 278 of Arenys de Mar

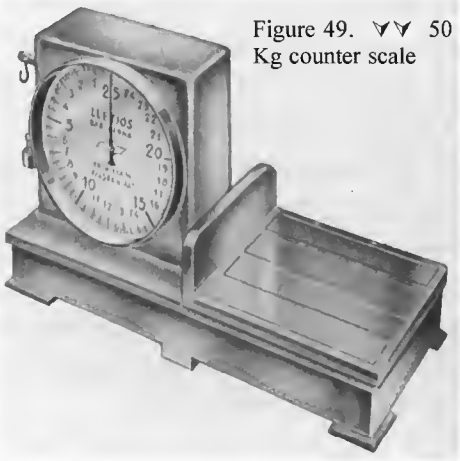


Figure 49. ⩔⩔ 50 Kg counter scale

The local magazine *Arenyautes* shows, in its edition of 28.4.1970 a clump of agaves on the lands of the Lletjós factory, because even more than fifty years later the area is still known as "the scales".

Figure 50. ⩕⩕ Platform steelyard still in production by 1940/50.

The Taxors of the University of Cambridge

BY CHRISTINE BIGGS

Who were the Taxors of Cambridge? What role did they play in the inspection of weights and measures? To answer both these questions we need to turn the clock back to the fourteenth century.

Until the end of the reign of Edward III, the Mayor and Bailiffs of the Town of Cambridge were the designated "Clerks of the Market", with responsibility for administering any enactments relating to Weights and Measures. However, Peterhouse, the first of the Colleges of what is now the University of Cambridge, was founded in 1284, and by 1380 there were eight Colleges, owning much property in the town. The students themselves were an aggravation to the townspeople, with their flamboyant clothes, and yet these same students suffered very primitive conditions within their Colleges. During the Peasants' Revolt of June, 1381, the tinder was ignited and violence flared; much mischief was done to the University by the Townsmen[1]. The new king, Richard II, reacted immediately. Whereas the University had been given authority by Edward for the Chancellor to be present when the Mayor and Bailiffs weighed and assayed bread and beer, and authority to correct and punish offenders should the Mayor and Bailiffs be negligent in their duties, a Charter of 1382 (5 Rich II) finally transferred responsibility for Weights and Measures in the Town to the University; the local Sturbridge Fair was explicitly included in this ruling. Moreover, a subsequent Charter, dated 16 February in the same year of Richard II's reign, contained measures to prevent the Mayor and Bailiffs from interfering with the University officers, when they were carrying out their Weights and Measures' duties.

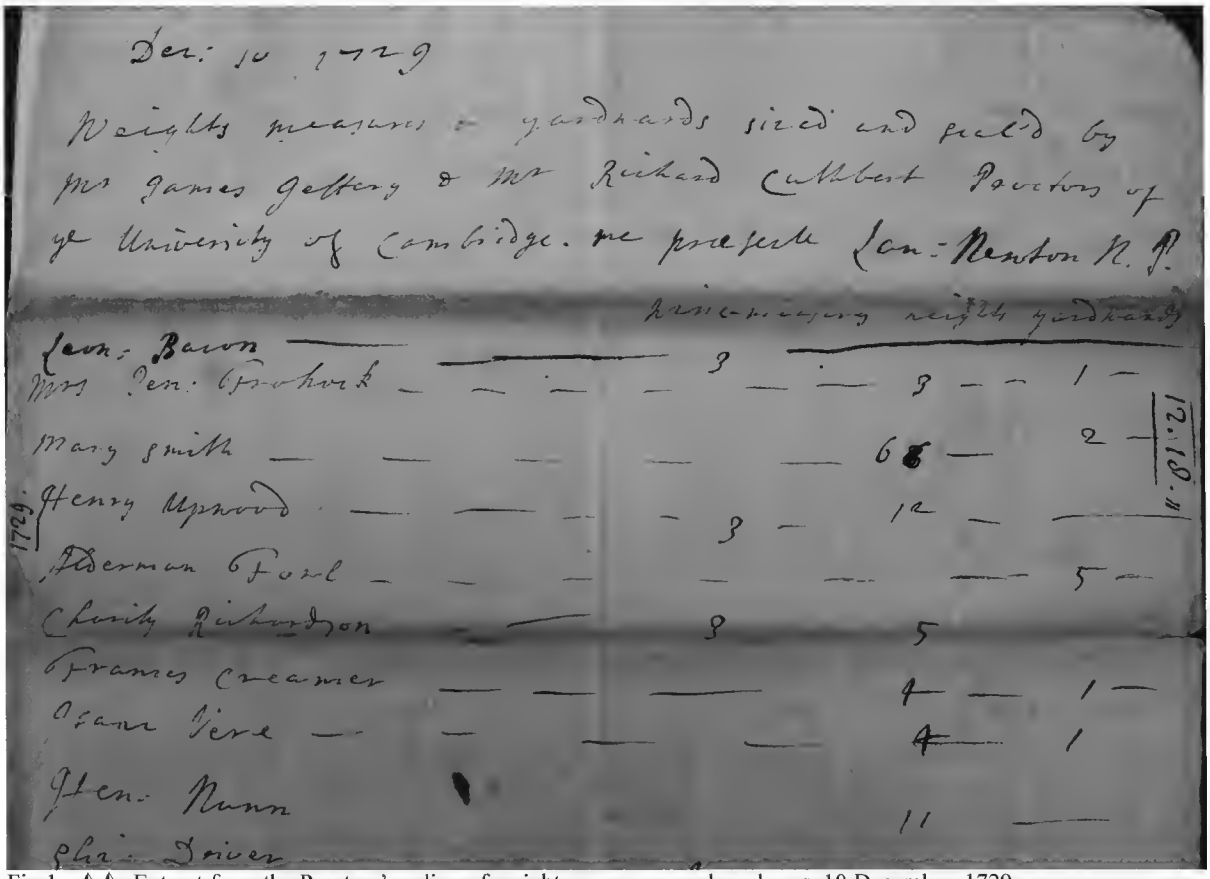
The 1382 Charters were confirmed at regular intervals by succeeding monarchs and, finally, in 1571 an Act of Parliament confirming these and all other Charters granted to the University was passed (13 Eliz); this Act also empowered the University to set up a public beam at Sturbridge Fair, allowing them to weigh hops and other bulky things. The Corporation had on numerous occasions tried to disrupt the University officers in the exercise of their duties but the disputes were always decided in favour of the University. To quote from an injunction of 1601:

Eliz: Reg:

To our Loving friends the Vicechancellor and proctors of the University of Cambridge and the Mayor Bailiffs and Burgesses of the Town.

Whereas there were at the last Sturbridge ffair Some Contentions about a pair of Scales used by you of the University: We require you of the Town in all peaceable Sort to Suffer the University to Exercise and use the same in the accustomed place as they have usually done for the most of these 10 years Last past and what Contention soever Shall seem to arise about the same Scales either for the interest of the Ground whereon they are Settled or for the payment of any Rent for the same We think it fit and so we Require of you that it be peaceably Reconciled hereafter in a Lawfull Course without giving any occasion of disorder: And so We heartily bid you farewell. Aug: 27. 1601.

A letter in a similar vein had to be sent by Charles II to the Mayor and Aldermen of the Town of Cambridge, soon after the Restoration. These instances of trouble between the Town and Gown are all recited in a Memo prepared by the Taxor, Thomas Johnson, of Magdalene College, dated 8 September, 1733[2], after demands had been made of the Taxors for a fee for the privilege of setting up the scales. In 1730 the Taxors' Right of Weighing Hops was tried by the Commissary, an officer of the University appointed to adjudicate on matters of dispute, and was determined in the Taxors' favour. In subsequent years, the Taxors turned the tables and let out their right to the Bailiffs to set up the scales, once for 6 guineas and twice for 6½ guineas but, when they tried to let out their right in 1733 for three guineas more than the Bailiffs were willing to pay, the Bailiffs retaliated by threatening to throw down the beam. Hence the "Case", and once again the Town failed.


Dec. 10 1729

Weights measures & yardwands sized and sealed by mr James Gelling & Mr Richard Cuthbert Proctors of ye University of Cambridge. we present Jon: Newton N. P.

Remaining weights yardwands

Jon: Baron					3			3		1	
Mrs Jen: Crowther											
Mary Smith						6	8			2	
Henry Upwood					3		12				
Alderman Ford										5	
Christy Richardson				8			5				
Frances Creamer							4			1	
Isaac Fere							4			1	
Jten: Nunn							11				
Chri: Driver											

12.10.11

1729

Fig 1. ▲▲ Extract from the Proctors' sealing of weights, measures and yardarms, 10 December, 1729.

The various legislation is further rehearsed in the *Case respecting the Power of the University of Cambridge in Inspecting Weights and Measures and punishing the Offenders therein And of their Power in Holding Court Leets*, prepared on 17 September, 1787 and sent to Mr Mansfield for his opinion; a copy of this document is held in Cambridge University Library.

This same document also rehearses the involvement of the Taxors, who had to be MAs of the University and were elected annually. By 1783, there had been a system in operation for some fifty years whereby the Proctors had responsibility for sizing and sealing weights, wine measures and yardwands (Fig. 1), whereas the Taxors handled the ale and dry measures, as evidenced by the records of the sealings (Fig. 2).

However, in 1783, the Senate proposed that the Taxors should have responsibility for holding the two Courts for examining and sealing all weights and measures and also that, at least twice in any one year, the Taxors should visit all dealers in commodities sold by weight or measure to destroy any defective ones, handing over the offenders to the Vice Chancellor, for punishment. Mr Mansfield's opinion was sought as to whether the Senate had the necessary powers to carry through the proposed reforms. To judge from the records of sealings subsequent to 1787, they did.

Thus it was the Taxors who were responsible for the supervision of all weights and measures in the Town of Cambridge just after the beginning of the nineteenth century when there was a national move to bring uniformity into the weights and measures system. The first serious attempt to achieve this was the Weights and Measures Act of 1834, but this Act proved to be virtually unworkable in practice.

The Weights and Measures Act of 1835 (5&6 Will.c.lxiii) was *An Act to repeal an Act of the Fourth and Fifth Year of His present Majesty relating to Weights and Measures, and to make other Provisions instead thereof.* One of the omissions in the earlier Act was the position of the University City of Oxford and Town of Cambridge, which already had their systems of weights and measures inspection, inherited from previous leg-

islation. Their position was addressed in section XLIV: *Provided always, and be it enacted, That nothing in this Act contained shall extend to prohibit, defeat, injure, or lessen the Rights or Privileges of either of the Universities of Oxford, or Cambridge, but that the Custody of the Assize, Assay, and Overlooking of Weights and Measures in the City of Oxford and its Suburbs, and in the Town of Cambridge, shall continue as heretofore and be in the Chancellor, Vice Chancellor, or his Deputy, of the said Universities respectively; and that the Chancellor, Vice Chancellor, of his Deputy; of each of the said Universities for the Time being, and none other, shall have the Power, and is or are hereby authorized, as Occasion may require, to appoint in and for the said City and Suburbs, and in and for the said Town respectively, an Inspector or Inspectors of Weights and Measures, ...*

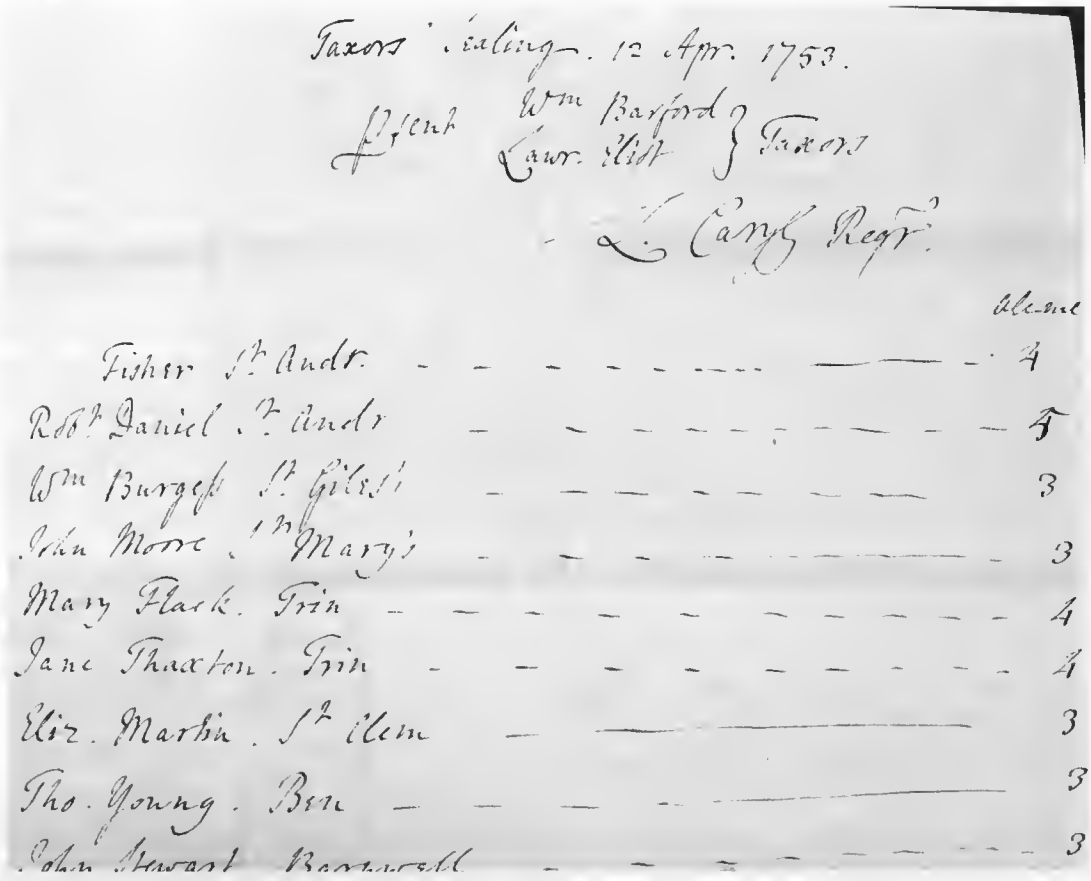


Fig. 2. ≺≺ Extract from the Taxors' sealing of ale measures, 12 April, 1753.

To THE EDITOR.—SIR,—I did not intend troubling you again, but that "Z" misapprehends me. I explained that the present Bread Act is so simple, that purchasing of a baker is now not different from the system adopted by the butcher, grocer, &c. I see no reason why a poor person shall not ask for a pound of bread as well as a pound of bacon, &c., although they let their account run weekly; and if the baker do not weigh it in the presence of the purchaser, he sells it illegally.

Some years ago, I was "Taxor's Man," of this University, and in entering some shops, found bread light of weight; this was seized;...

JAMES LEVETT,
Inspector of Weights and Measures for the
October 6th, 1842. County of Cambridge.

Fig. 3. ⩚⩚ Transcription of an extract from a letter from Levett, *Cambridge Independent Press*, 8 October, 1842.

And it was James Levett, a Taxor's man (Fig. 3), who was appointed as the first Inspector of Weights and Measures for the County of Cambridge under this Act.

The unrest between the Town and Gown continued to fester on several fronts and one particular thorn was the supervision of weights and measures within the Town. It was claimed that the Taxors were somewhat inactive and that, should they seize defective weights and measures, no proceedings for penalties were ever taken against the guilty parties. After receiving a memorial from the Mayor, Aldermen and Burgesses of the Borough of Cambridge, dated 5 February, 1852[3], the Commissioners for enquiring into the State, Discipline, Studies, and Revenues of the University and Colleges reported to the Queen on August 30, 1852. Amongst their recommendations was:

12. *That in the present state of things the inspection of weights and measures would be more conveniently exercised by the municipal authorities than by the University; and that the office of Taxors might be discontinued.*[4]

Three years later, in 1855, one of the issues in the hearing of *the matters in difference between the University and Town* by Sir John Patteson, the Arbitrator, held at the Law Institution in Chancery Lane, London was:

6. That the peculiar and exclusive jurisdiction of the University as regards the supervision of weights and measures ought to be abolished and transferred to all the Justices of the Peace.[5]:

Sir John Patteson decided against the University. This was enacted in the so-called Cambridge Awards Act of 1856 (19 Vict.c.xvii, section 13): *All power and authorities with respect to the supervision of weights and measures in the borough (except powers and authorities incidental to the office of inspector) shall be transferred from the university and its officers to the Justices of the Peace of the Borough.* Section 14 of the Act authorized *the Vice Chancellor to lend to the Corporation of Cambridge the standard weights and measures now in the custody of the Taxors, taking an engagement from the Corporation to return the same on demand.*[6] The engagement was realised in a bond for the safekeeping of the standards *in good plight and condition.* When a search was made of the Town records in 1956, there was no sign of the counterpart of this bond, only a Council Minute, dated 10 November 1856, recording that a bond for £400 had been sealed by the Town Clerk on 23 October 1856. However, an approach to the University Archivist not only produced the Bond but he also reported the matter to the Senate. The Senate decided to present the Bond to the Corporation, so that the Standards were then permanently transferred to the Corporation; this was effected on 22 October 1956[7]. Some of the older University Standards are currently housed in the University Combination Room in Senate House Lane whilst others are on display in the Cambridge and County Folk Museum.

Section XXI of the 1835 Act had required that the Inspectors of Weights and Measures be provided with *good and sufficient Stamps for the stamping or sealing Weights and Measures used or to be used..., which Stamps so provided shall be taken to be the Stamps for such County, Riding, or Division, County of a City or County of a Town.* What stamp did the Taxors of Cambridge use? Ricketts[8] used the authority of L. C. Porter[9] to claim that their stamp was made up of their initials. Ricketts includes an illustration (Fig. 4) of a putative Taxors' stamp, but he does state that the mark has not definitely been attributed as a Taxors' stamp.

Fig. 4. The mark shown by Ricketts as a putative Taxors' mark.

However, we have an earlier authority for the form of the Taxors' stamp. A section in *Gunning's Ceremonies of the University of Cambridge*[10], entitled *Sealing of Weights and Measures* reads:

This Sealing is generally in the Law Schools. The time for holding it is settled by the Taxors and Registrary. It seems most regular to hold it before the Court Leet is held.

A short time before the sealing, notice is given by a proclamation prepared by the Registrary, and carried by the Yeoman Bedell to the Vice-Chancellor for his signature. (The measures of Inn-holders and Milk-sellers are particularly mentioned in the proclamation.)

The Yeoman Bedell gives notice in several parts of the Town two or three days before sealing.

The Senior Taxor provides a stamp for sealing with. It has the initial letters of the surname of each Taxor.

On the first day, weights, wine measures and yardwands are tried..... On the second day the Yeoman Bedell, the Taxor's servants and the University Gager attend. Ale and milk measures, bushels, pecks and quarterns are tried..... The Yeoman Bedell has five shillings for each day's attendance; each of the Taxor's servants eighteenpence; the Gager half-a-crown. The Taxors half-a-crown. The Taxors are appointed annually by the University.

And the records of these sealings are still held in the Cambridge University Library, as illustrated in Figs. 1, 2 and 5.

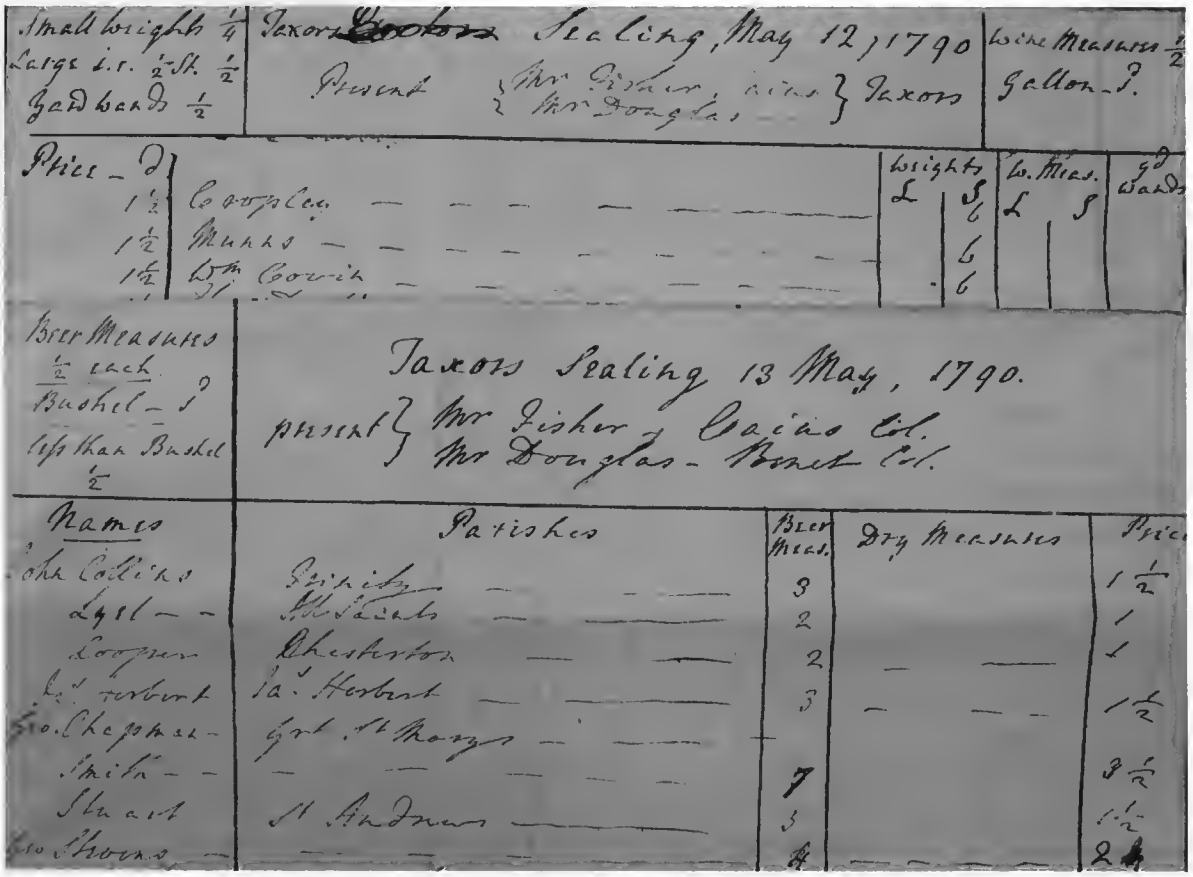

Taxors Sealing, May 12, 1790
Present Mr Fisher, Mr Douglas } Taxors
Taxors Sealing 13 May, 1790.
Present Mr Fisher of Caius Col. Mr Douglas - Bonet Col.

Fig. 5. ➢➢ Extract from the Taxors' sealings, after they had assumed full responsibility, 12 & 13 May 1790.

But how was this information to be used? About thirteen years ago, when we were first interested in the history of weights and measures inspection in Cambridgeshire, we had a weight in the Norman L. Biggs collection that carried verification marks for the Town and County of Cambridge and the initials TB (Fig. 6), together with one that carried verification marks for the County of Cambridge but the initials HM (Fig. 7). Whereas the first weight could be linked to the Town of Cambridge, this didn't necessarily hold for the second one and it had been filed as needing further investigation.

Fig. 6. ⮜⮜ A 4 oz bronze weight, stamped by the Taxors in the academic year 1854-5; it also bears the B of C mark, used by the Borough of Cambridge authority after 1856, and the VR565 mark, used by Cambridgeshire in the period 1890-1901.

Fig. 7: ➢➢ A 2 oz brass weight, stamped by the Taxors in the academic year 1850-51; it also bears the early crowned V over C of C mark of Cambridgeshire and the later CD over C mark of the Cambridge district of Cambridgeshire, used between 1856 and 1890.

But information on Taxors was thin on the ground. We knew that, in 1835, the Taxors, the Rev John **Graham,** of Queen's College and the Rev. Samuel **Ward,** of Magdalene College, were acting as Weights and Measures Inspectors for the Town of Cambridge. Similarly, when the standards were reverified in 1840, they were delivered to the Taxors, the Rev. William **Bailey** and the Rev. John **Mills**. In 1855, *Craven's Directory*[11] named the Taxors for that year as T. E. Reed (King's) and Bright Mynors (Magdalene). We had a few select pieces of the jigsaw puzzle but nothing linked together. And there the matter rested.

However, about a year ago, the subject was revisited when, at Ardingly Antiques Fair, we bought another weight, this time with the verification marks for the Town and County of Cambridge but with the initials ED (Fig. 8). What was happening?

Fig. 8. A 1 oz brass weight, stamped by the Taxors in the academic year 1855-6; it also bears the B of C mark, used by the Borough of Cambridge authority after 1856.

A visit to the British Newspaper Archives allowed us finally to link together the pieces of the puzzle. The *Bury and Norwich Post*, 18 October 1854, named the Taxors for the academic year 1854-5 as the Rev. Edward Reed **Theed**, of King's College, and the Rev. Mynors **Bright,** of Magdalene College; we had the initials TB (not RM as previously)! Similarly, the same paper for 17 October 1855, named the Taxors for the following academic year as the Rev. Joseph **Edelston**, of Trinity College, and the Rev. Charles Style **Drake,** of Jesus College, giving us ED. The HM weight was retrieved and there, again in the *Bury and Norwich Post*, 16 October 1850, we had that the Taxors for the academic year 1850-1 were the Rev. Henry George **Hand**, of King's College, and the Rev. William **Marsh**, of Trinity Hall, the required HM. Not unexpectedly, the weights bearing the Borough of Cambridge verification mark had been stamped towards the end of the Taxors' existence!

A visit to the Cambridge University Library allowed us to complete the list of Taxors from 1724 to 1856, when responsibility had moved away from the Taxors. So, if you have a weight with verification marks for the County and/or Town of Cambridge and some additional initials, we shall now be able to tell you the academic year in which it was verified.

References:

1. Reeve, F.A., *Cambridge*, Batsford, 1964, pp 32-36.
2. Johnson, Thomas: *The Case of the Taxors of the University and Bailiffs of the Corporation concerning the Right of Weighing hops in Sturbridge Fair*, 1733 (Bowtell Request, Downing College).
3. Cooper's *Annals of Cambridge*, Vol. 5, p. 43.
4. Cooper's *Annals of Cambridge*, Vol. 5, p. 75-77.
5. Cooper's *Annals of Cambridge*, Vol. 5, p. 185.
6. *Cambridge Independent Press*, 25 October, 1856, p. 5.
7. *Cambridge Daily News*, 23 October, 1856.
8. Ricketts, C. *Marks and Marking of Weights and Measures of the British Isles*, 1996, p. 189.
9. Porter, L.C. *Weight Stamps Down The Ages*. *Country Life*, 28 February, 1957.
10. Gunning, H. *Gunning's Ceremonies of the University of Cambridge*, 1828, being an edited version of Adam Wall's 1798 *Ceremonies of the University of Cambridge*, cited in *Monthly Review*, 1906, p. 118 and again in Monthly Review, 1957, p. 23.
11. Craven, *Directory of Huntingdonshire and the Town of Cambridge* (Shaw & Tipper, 599).

An Early Rocker

BY NORMAN BIGGS

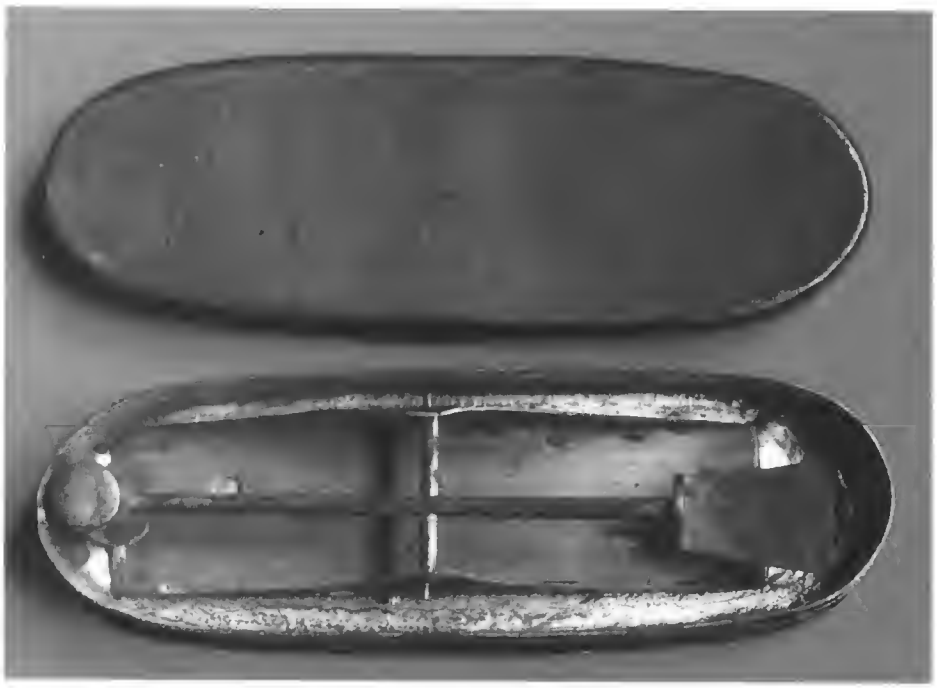


Figure 1. ≺≺ The rocker is fixed to the base of the box; size 83 mm x 28 mm.

The 'rocker' shown in Figure 1 was bought at an antique fair as a 'coin scale', which it undoubtedly is. However, it has no markings to tell us who made it, or when, or for what purpose. It is most unlikely that we shall ever know the name of the maker, but there are several clues as to its origins. Because a rocker is intended simply for detecting false coins, rather than establishing their exact weight, it is reasonable to suppose that the maker was not a specialist scale maker. The box is made of tinplate, and the mechanism is made of sheet brass, which suggests a general metalworker, such as a 'tinman and brazier'. There were many of these listed in provincial directories from about 1780 onwards, and other titles like 'whitesmith' or even 'ironmonger' might easily include tradesmen who could have produced this object.

Fortunately there is better news when it comes to determining the function of the scale. Rocker-type scales began to appear in the latter part of the eighteenth century, and examples made by Pyke of Bridgwater[1] and Pickett of Marlborough[2] are known. On the assumption that this rocker was intended to check one specific coin, my first step was to determine the weight that causes the beam to turn. It is about 2.8 g, or 43 troy grains, which points strongly to the gold third-guinea, minted from 1797 to 1813. This coin was also known as the seven-shilling piece, the guinea being twenty-one shillings. It was produced at the time of the Napoleonic wars, when the minting of guineas and half-guineas was halted as a precaution against French invasion. Genuine specimens of the seven-shilling piece are available nowadays, but they are rather expensive, and I was fortunate to have several of the contemporary weights[3] intended for checking the coin. So I was able to confirm that the beam does indeed turn when tested with the right weight (Figure 2).

Figure 2. ≺≺ The beam turns gently when loaded with the correct weight.

The seven-shilling piece was in circulation for about 15 years, and counterfeits were common. There are many warnings in local newspapers (Figure 3).

There are at present a number of counterfeit Seven Shilling Pieces in circulation, against which we wish to caution the Public. It has been contrived to circulate a great proportion of this sort of base coin in the markets; and the pieces have of course found their way into the hands of most of the dealers in the principal necessaries of life. They are pretty well executed, and bear the date 1804. Upon examination, however, it will be found, that they are much lighter than the Mint pieces.

Figure 3. ⩙ From the *Caledonian Mercury*, 29 November 1806, page 3.

The counterfeits can now be bought more cheaply than the genuine coins, and so I was able to confirm that the rocker is indeed fit-for-purpose, because the beam does not turn when loaded with a fake (Figure 4).

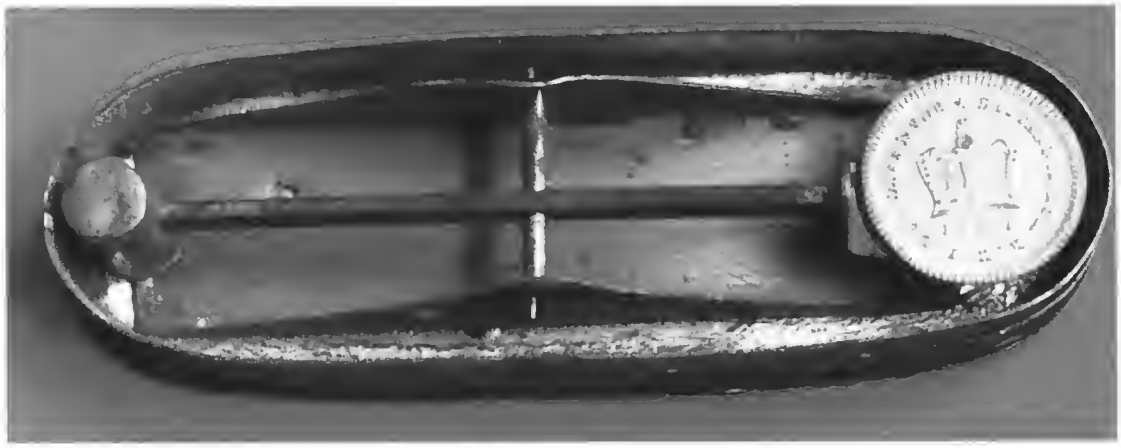


Figure 4. ⩙ The beam does not turn when loaded with a fake coin.

This little investigation is thus brought to a satisfactory conclusion. We can be fairly sure that, around the year 1800, an enterprising metalworker decided to produce a cheap and simple device for detecting counterfeit third-guineas. Probably only a small number (less than 100) were made, and they were sold in a town or city where the counterfeits were causing trouble. It is possible that another example will turn up, or that an advertisement for it will be found. If so, please let me know!

References:

1. Crawforth-Hitchins, D. *Thomas Pyke, Brass Founder and Boaster EQM* (2013) 3971-3977.
2. Crawforth, M.A. *Sovereign Balances* (Oxford, 1984), figure 2.
3. Withers, P. and B. *British Coin-Weights* (Llanfyllin, 1993), items 2150-2160.

ISASC

EQUILIBRIUM

QUARTERLY MAGAZINE OF THE INTERNATIONAL SOCIETY OF ANTIQUE SCALE COLLECTORS

2014 ISSUE NO. 2 PAGES 4021 - 4048

Cover Picture

Lewis E. Brown, of Cincinnati, Ohio was awarded US Patent number 210,493 on December 3, 1878, for a *Spring Weighing-Scale*. This earliest, *Patent App'd For* example is extremely rare. Made of cast iron and painted green and gold, its design matches the patent drawing shown on the original patent. Made for household use, its pointer is affixed to the goods plate so that the weight is registered by the pointer when the load is applied.

The rectangular brass chart is graduated from 0 to 24 by pounds with numerals for each 4 pound increment. The scale measures 9 5/8" tall, the base diameter measures 5 5/8" and the plate diameter is 5".

Later L. E. Brown candlestick scales were made of brass and zinc and are more common than is this example. See EQM pages 3101 and 3131 for more information.

Contents

A Bridge Not Quite Far Enough
John Knights 4023-4026
Book Review
Ritzo Holtman 4027
Scales for Michigan's Furniture Industry
Utz Schmidt 4028-4033
The Covel-Hanchett Scale
Kurt Beyreis 4034-4036
Single-coin Rockers and Their Lack of Markings
Michael Foster 4037-4043
A Unique Dutch Letter Scale
Rein Kok 4044-4045
A Type of English Fish Scale
Kurt Beyreis 4046
Patently Interesting 4047
Scales and Sports
Paddy Whyte 4048

INTERNATIONAL SOCIETY OF ANTIQUE SCALE COLLECTORS

EQUILIBRIUM is published quarterly in February, May, August and November.

ISSN: 0893-2883

A Bridge Not Quite Far Enough

BY JOHN KNIGHTS

The weighbridge was famously invented by John Wyatt in the mid 18th century. In reality John Wyatt invented half of the weighbridge, ie. the four point suspension bottomwork (Fig.1) that formed the basis of the mechanical weighbridge until it was superseded by the electronic load cell in the 1970s. The load on the Wyatt machine was counterbalanced by proportional weights placed on a weightable, on the end of the transfer lever, with a comparatively low mechanical advantage, typically 1:20, so that one ton was balanced by a hundredweight. He never got round to attaching a steelyard or other indicator to his platform as became the norm in later machines.

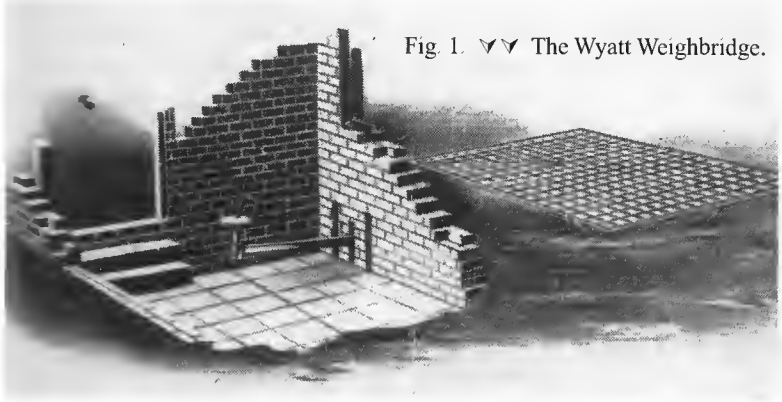


Fig. 1. ⋎⋎ The Wyatt Weighbridge.

By the end of the 19th century weighbridges had moved away from the Turnpike and the Workhouse where the Wyatt machines had been used and moved into general trade use. By 1890, it was deemed necessary to include these large capacity machines in the regulatory framework and test procedures were developed to ensure their accuracy. The 'Model Regulations' of that year set out a series of tests for large capacity machines and bizarrely, these remained unaltered until the 1980s, despite the all too apparent technical developments and improvements that occurred in the interim.

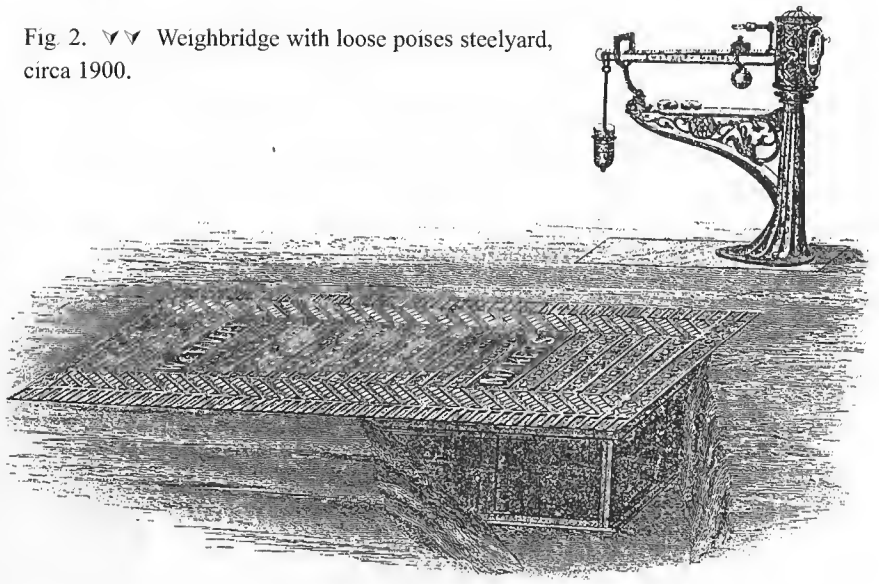


Fig. 2. ⋎⋎ Weighbridge with loose poises steelyard, circa 1900.

Fig. 3. ⋎⋎ Loose poise steelyard recorded in the 1970s.

By the 1890s, weighbridges had steelyards attached with their much higher mechanical advantage than the Wyatt weightable but the resistance to the load was still mainly provided by a number of loose poises (Figs. 2 & 3). Typically, by the time the load had gone through the Y levers, the transfer lever, the reduction lever and the steelyard, the proportional value of the counterweight was approximately 1lb = 1 ton. The test for such machines was to firstly test the minor poise which traversed a graduated scale on the steelyard and provided the pounds and hundredweights of the load. The ton

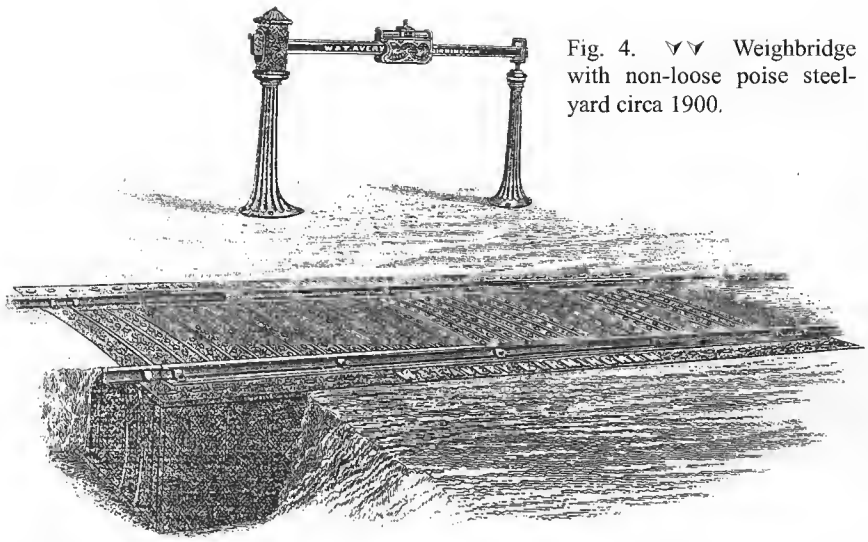


Fig. 4. ⋎⋎ Weighbridge with non-loose poise steelyard circa 1900.

poises were then individually tested by putting them on the hanger and testing with one ton of standard weights on the platform. Thus with this type of machine all the weighing components could adequately be tested with just the one ton of standards. The rest of the testing could be done with a quantity of loose material. The procedure was to load the machine to within a ton of its total capacity and then add the ton of standards to ensure the loaded machine behaved the same as the unloaded machine, indicating that nothing was bending, flexing or collapsing and that the face lines of the knife edges were correctly set. The sensitivity or so called 'power' test, if the machine was an accelerator, would also be performed at the maximum load. The Model Regulations recognised that this was a minimal test and recommended that, if only a ton of standards was available, a ton by ton test could be achieved by a series of substitutions for the standard ton all the way up to the maximum. Experience would show that such a procedure was not only impractical but a potential source of error and it was dropped in later regulations. The 1907 Regulations gave the option of testing ton by ton but recognised that large quantities of standard weights may not be available so permitted the test using just one ton. This, unbelievably, remained the situation until proper OIML tests were adopted in the 1980s.

This situation became increasingly nonsensical as loose poise steelyards were replaced by ones with sliding poises (Figs. 4 and 5) and totally meaningless when dial machines became the norm. If not recognised by the legislators the absurdity of the situation was recognised, at an early stage, by the inspectors who were charged with verifying this equipment, usually without access the large quantities of standard weights needed to do the job properly. In lieu of the required facilities, various pragmatic, if less than perfect solutions were suggested to perform an adequate test. One authority, for instance, employed a horse drawn laden wagon whose weight was accurately ascertained and which was driven round the city and put on each weighbridge in turn to check the accuracy at a reasonably high load.

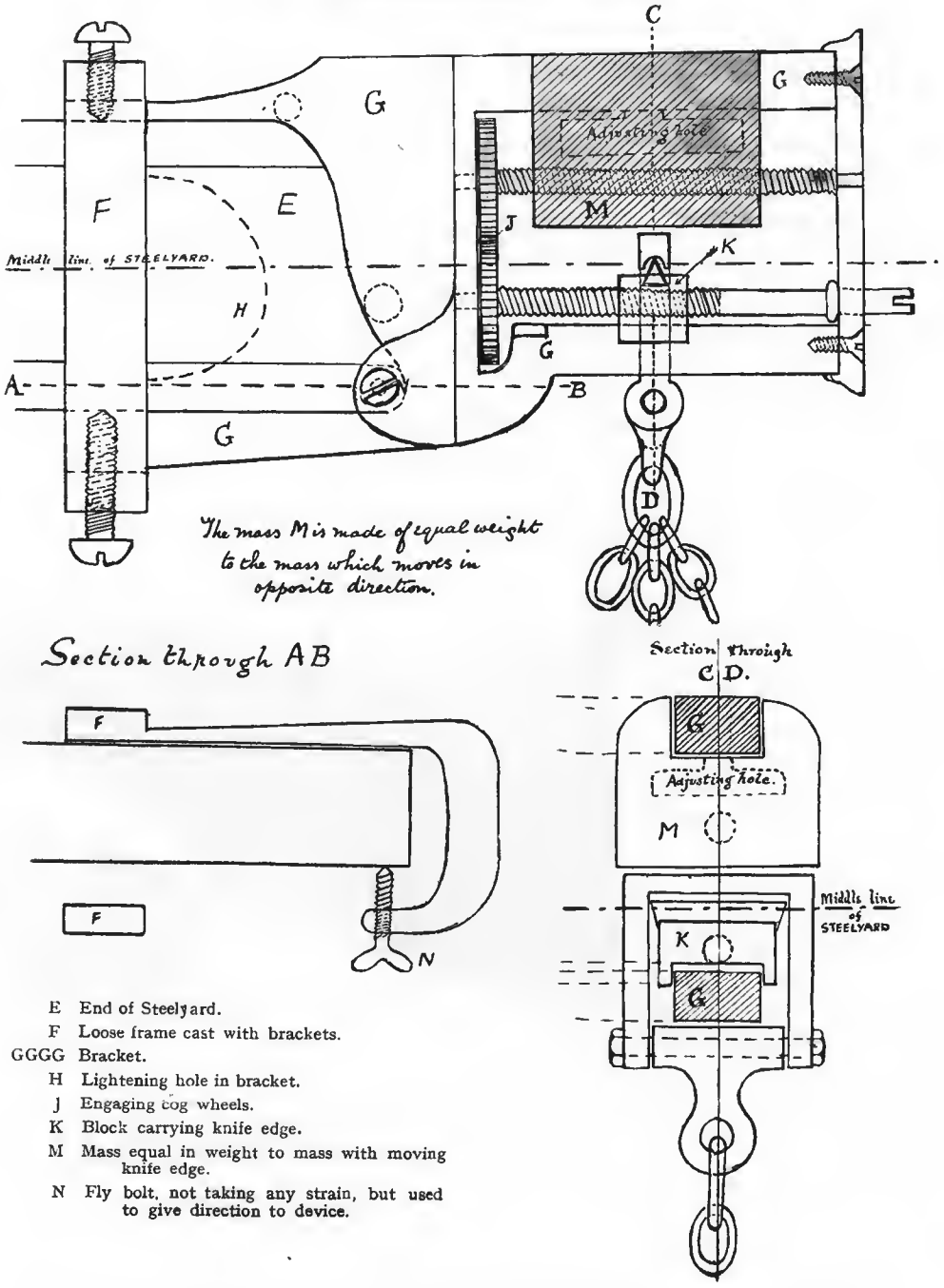
Fig. 5. ⋏⋏ Non-loose poise steelyard.

By 1912, an Inspector called R. H. Martin applied his mind to the problem and came up with an innovative solution that he published in the *Inspectors' Monthly Review* of November 1912. He and his colleagues in the Cornish Weights and Measures Department developed an, admittedly, 'Heath Robinson' device that allowed the testing of the notches on a non-loose poise steelyard, using only one ton of weights and without having to cumulatively substitute on the load plate. He

called this device an adjustable inductor and in the article, he described its operation.

The standard minimalist test was first carried out; ie. the machine was loaded to within one ton of its capacity with loose material and the ton of weights was then put on the plate, the error of the last notch checked and the 'full load' tests carried out. The ton of weights was then removed from the plate and the 'inductor' was clamped to the end of the steelyard. The device consisted, simply, of a bracket with a knife edge with a weights pan hanging from it as shown in Fig.6.

R. H. MARTIN'S ADJUSTABLE INDUCTOR
For Testing Self-Contained Steelyards.
(Provisional Specification No. 12061.)



E End of Steelyard.
F Loose frame cast with brackets.
GGGG Bracket.
H Lightening hole in bracket.
J Engaging cog wheels.
K Block carrying knife edge.
M Mass equal in weight to mass with moving knife edge.
N Fly bolt, not taking any strain, but used to give direction to device.

Fig. 6. ⩓ Diagram of Mr Martin's Adjustable Inductor, published in November, 1912.

The steelyard would then be rebalanced by moving the major poise back one notch and using the minor poise to counterbalance the inductor. The ton of standard weights was then replaced and small weights placed in the pan of the inductor until balance was again achieved. The amount of weight added would typically be about 1¾ lb and this was described as a 'ton equivalent' value. The device had a further feature that could be used to ensure that the 'ton equivalent' weight was a nice round value so there was no need to fiddle about with subdivisions of an ounce in the ensuing test. The knife edge assembly was mounted on a threaded rod, which when turned, would move the knife edge to alter the leverage value and this would be adjusted until a convenient ton equivalent value was achieved. In order to prevent this adjustment disturbing the balance of the steelyard the screw also caused a metal block, of identical weight to the pan assembly to move by an equal but opposite distance.

The test procedure was now straightforward. The poise on the major bar would be moved back towards zero, notch at a time. At each notch another 'ton equivalent' of weights would be added to the pan to re-establish equilibrium. Errors at each notch would be ascertained by use of small weights on the load plate or by use of the minor poise. It was thus, in theory, possible to check the accuracy of each notch on the major bar and thus achieve a comprehensive test of the weighbridge.

This was a valiant attempt to deal with an unsatisfactory situation. Weights and Measures Departments were a typical 'Cinderella' service and would have been strapped for cash and resources. Most would have been accustomed to testing scales up to a ton or two in capacity and might have been in possession of a ton or so of 56lb weights. Weighbridges would, in the early 1900s, weigh up to 10 or 20 tons and even more in the case of rail weighbridges. Most Departments would have no prospect of acquiring 400 or 800 such weights, let alone the manpower required to heave them about.

There was however quite a backlash against Mr Martin and his innovation. Later editions of the Review contained several letters from other inspectors who raised objections to his device, claiming that the principle was flawed and that its use would not reproduce a true test. He did however produce some evidence to show that an inductor test did accurately reproduce a comprehensive test using a full complement of standard weights.

I'm not aware that the device was ever widely used! It may never even have migrated beyond the confines of Cornwall and of course the production of machines with dial indicators soon rendered the whole thing obsolete.

Eventually a proper solution to weighbridge testing was provided in the form of the mobile testing unit carrying half ton roller weights (Fig 7). These were operated by the larger departments and were hired out to the impecunious smaller authorities. The roller weight remained in use until recent times and offered a 'convenient' method of test. As for the joys of manually trundling around half ton lumps of cast iron; well that's another story.

Fig. 7. AA Roller weight test unit in use in the 1970s.

Book Review

Balances - Instruments, Manufacturers, History by Erich Robens, Shanath A.A. Jayaweera and Susanne Kiefer, Available as hardcover book ($179 or £117, ISBN 978-3-642-36446-4) or as eBook (PDF, $139 or £93.50, ISBN 978-3-642-36447-1). Size: XX + 730 pp., 763 ill. (539 in colour).

Around 1973, Hans Richard Jenemann (1920-1996) started to collect lab balances; from 1977 he published approximately 70 articles and books regarding the development of The Balance.

His extensive balance collection is partly exhibited at the DECHEMA at Frankfurt am Main (Germany). A large part of it was sold to Mettler-Toledo at Giessen (Germany), which has financed the annual 'Paul Bunge' prize. The remaining 150 balances were sent to the Riedschule balance museum at Albstadt-Onstmettingen (Germany), where they are part of the 1,000 balance collection exhibited there.

Jenemann planned a 'universal' book on balances but was unable to realise that vast concept. Based on his publications and slide archive, but NOT based on his library and collected notes (still in cardboard boxes at the municipal house at Onstmettingen), Erich Robens, assisted by Shanath A.A. Jayaweera and Susanne Kiefer, has written instead a sizeable book in English. The slide archive of Richard Vieweg (1896-1972, former president of the Physikalisch-Technische Bundesanstalt), has also been used for this book.

This lexicon forms a springboard for anyone who collects balances and is interested in their technical development and backgrounds. After an introduction regarding mass and gravitational force there follow chapters on weight systems, weighing methods, the characteristics of balances and a description of dozens of different balance types.

The less technical side is also given a chance, like Weighing the Soul and The Balance in Art. Furthermore, listings of museums with balance collections, sketches of the development of the balance industry in a few countries, and an extensive listing of balance manufacturers and dealers worldwide are given. Out of necessity the bibliography has had to stay short and it sketches the outlines of several subjects that deal with weighing.

It is impossible to offer a complete overview of the balance in one book, but the many references make this book reasonably complete. Background information and extracts of this book can be found at www.springer.com/978-3-642-36446-4 .

The Springer website has the following verbatim English description of the book:

**Displays measuring weight in all ways possible*
**Reviews the reliability of the various methods to measure weight*
**Gives a historical survey of the development of scales*
**Richly illustrated with several hundred rare photographs, reproductions and drawings of the instruments and their uses*
**Presents indirect mass determination*
**Gives advice to researchers and engineers about choosing the weight system*

The book deals mainly with direct mass determination by means of conventional balances. It covers the history of the balance from the beginnings in Egypt earlier than 3000 BC to recent developments. All balance types are described with emphasis on scientific balances. Methods of indirect mass determination, which are applied to very light objects like molecules and the basic particles of matter and celestial bodies, are included. As additional guidance, today's manufacturers are listed and the profile of important companies is reviewed.

Several hundred photographs, reproductions and drawings show instruments and their uses. This book includes commercial weighing instruments for merchandise and raw materials in workshops as well as symbolic weighing in the ancient Egyptians' ceremony of Weighing of the Heart, the Greek Fate balance, the Roman Justitia, Juno Moneta and Middle Ages scenes of the Last Judgement with Jesus or St Michael and of modern balances. The photographs are selected from the slide-archives of the late Richard Vieweg (1896-1972) (former President of the Physikalisch-Technische Bundesanstalt, Braunschweig, Germany), of the late Hans R. Jenemann (1920-1996) (former head of the Analytical Laboratory of Schott & Gen., Mainz, Germany) and of his wife Irene (1933-2008) and of Erich Robens.

RITZO HOLTMAN

Scales for Michigan's Furniture Industry

BY UTZ SCHMIDT

Read the story about another victory for balances, this time in the furniture industry.

To fathom the greatness of Grand Rapid's furniture industry, just look at the marvelous *Centennial Bedstead* (Fig. 1) from Nelson, Matter & Co on display at the Philadelphia Centinneal Exposition of 1876. Larry Massie[1] describes it as follows: *It must have been the biggest, most ornate bed in the world, a pallet fit for a king. A man standing on his tiptoes on another's shoulders could not touch the top of the backboard...The suite carried a price tag of $10,000 at a time when factory workers earned an average $1 for a 10-hour workday, and a square mile of government land sold for $800.*

Fig. 1. ⋎⋎ Centennial Bedstead; collection Grand Rapids Public Library.

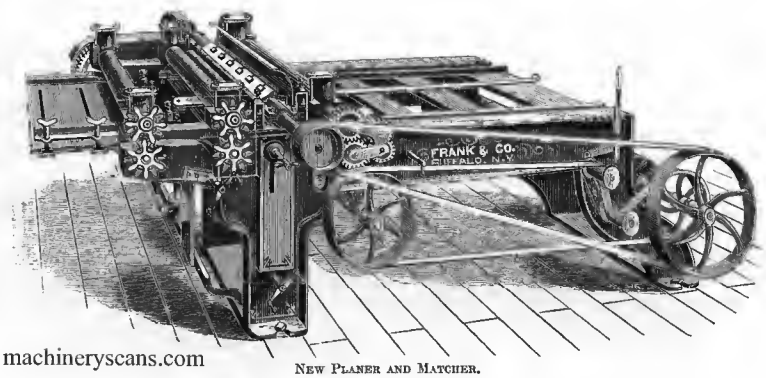
Surprise, surprise! In order to make fancy furniture, specialty balances were indispensible. Stephen Barnett introduced us, in 2013 issue No. 3, to his great find, the Grand Rapids Lumber Tester, with box and description.(Fig. 2) The wood for veneer production needed to be dried to a point that it did not crack during the slicing process and again afterwards during the additional drying. Boy, the rotary lathes were clunky machines, peeling layer after layer from a tree trunk which was roughly smoothened prior to clamping it into the holding fixture. Coe Manufacturing Company, from Painesville, Ohio, patented in 1888, the design shown here. (Fig. 3 & 4) During the demonstration it took only a few minutes before the machinists had covered the ground with panels of veneer. Not shown in the picture was the great care taken with stacking and clamping these precious sheets for the final drying process and the finishing work. Other slicing processes were as well in use, because sawing veneer proved to be too wasteful.

Fig. 2. ⋏⋏ Example of Grand Rapids Lumber Tester.

Fig. 3 & 4. ≺≻ Slicer, Coe Manufacturing. Co., Painesville, Ohio. Patented June 5, 1888. Collection at Thumb Octagon Barn Agricultural Museum, Gagetown, Mich.

Fig. 5. ≺≺ The blades of the slicer are very sharp to allow the machine to cut thin layers of veneer from a tree trunk.

Fig. 6. ≻≻ The weight of the planer knives had to be balanced and equal in total weight.



New Planer and Matcher.

In the above process the cutting knife is stationary (Fig. 5) and proper sharpening is sufficient. On the other hand, sharpening the fast rotating knives of a planer is more demanding. Planer knives need to be balanced from end to end, and in addition the total weight of each blade in a set of three or more knives had to be identical. Otherwise, the planer would vibrate and ruin the product while damaging the planer. (Fig. 6)

That's where Edward Augustus Munson comes in – you learn about his importance, his life and his success. Born on December 5, 1846, in New York, he moved with his parents to Onondaga County in the State of New York. At the age of 30 he married Harriet Agnes Winchester in nearby Buffalo. It was the time when Michigan beat the drums to attract settlers, and the young family heard the call of the praised paradise and followed it. Just after arriving at their new home in Grand Rapids in 1878, their son, Ray W., was born. Edward, now in the center of the woodworking industry, saw a chance to start his own business. He is listed in the 1880 census[2] of Grand Rapids as an axe manufacturer. Soon he added edge tools to his assortment of products, and it seems his precision work became known for excellent quality. No wonder that manufacturers contacted him to sharpen their planer knives, which is, as we heard, quite a tedious job. However, the outcome was often not satisfactory when he used the Defiance Proportional Balance, patented in 1882. (Fig. 7) There was just no money to be made with the required number of steps to balance the knives. In case you are interested in more details, please read the well researched article from Cliff Lushbough in EQM 2004, Issue No. 4.

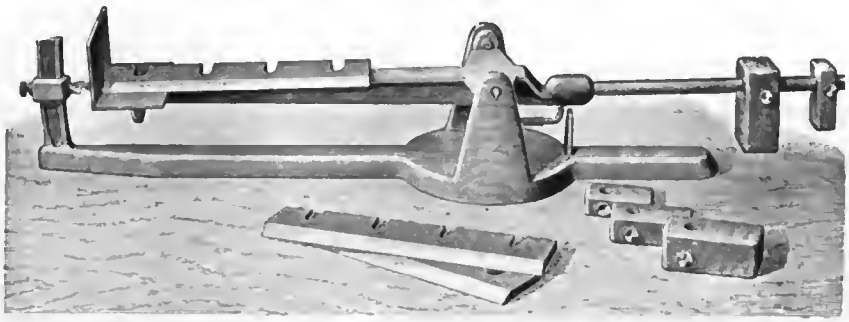


Fig. 7. ⋏⋏ **Patent Proportional Knife Balancing Machine.**

The fast growing business needed expansion; so in 1884, Edward partnered with the G & S Mill owner Sam T. Gamwell[3]. (Fig. 8) This forced Edward to think about better ways to balance knife blades allowing him to keep up with the incoming orders. The breakthrough came in 1895 when he applied for a patent of his *Proportional Weighing Apparatus*. The patent was granted, exactly to the day, a year later on May 31, 1896. (Fig. 9) The balance itself is just a marvel of ingenuity. (Fig. 10) Functionality and simplicity are amazing, and this echoes also in the statements of customers.

S. T. Gamwell has purchased an interest in the edge tool works of E. A. Munson, on Mill street, and the firm will hereafter be known as Munson & Gamwell.

Fig. 8.

WHAT CUSTOMERS THINK OF IT

WIDDICOMB FURNITURE CO., Grand Rapids, Mich. – we have one of your planer knife balance scales which we substituted for the ordinary scale we had in use for several years, for your device accomplishes the balancing of planer knives so accurately that it was in the writer's opinion an indispensible part of our machinery equipment, and we threw out the old scale, purchasing the new one from you.

(No Model.)

E. A. MUNSON.

PROPORTIONAL WEIGHING APPARATUS.

No. 557,140. Patented Mar. 31, 1896.

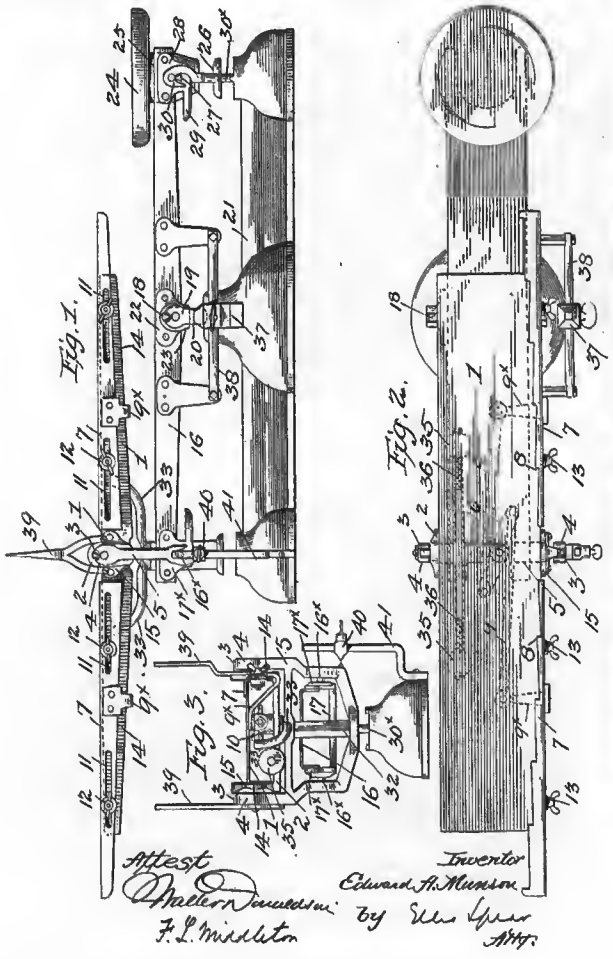


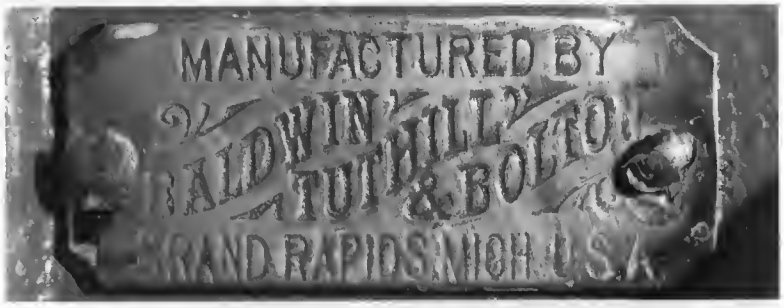
Fig. 10. ⅄⅄ Munson Patent US Patent Office.

Fig. 9. ⅄⅄ Munson Balancer collection Jim Dietrich.

STATEMENTS FROM OTHERS

...It is a great convenience and we could not afford to do without it. ...pleased to state that it has given us entire satisfaction and I think it is indispensible in balancing planer knives for doing smooth and accurate work.

Fig. 11 & 12. ⅄⅄ Munson Balancer collection Utz Schmidt.



What a coincidence Baldwin, Tuthill & Bolton[4] had just opened their doors in 1889, to make sharpening machinery, blade guides, and a few machinists' tools. They embraced the opportunity to add the Munson balance to their products as we see from the above label on a balance, still showing the Munson name and patent on the beam. (Fig. 11 & 12)

Fig. 13. ⋎⋎ Munson Balancer collection Utz Schmidt.

Michigan Tradesman touts Munson Proportional Balance *25 February 1901 (page 249)*[5].

E.A. Munson, 51 Mill Street, Grand Rapids, Mich., has invented and is now manufacturing a device that will interest manufacturers using planer knives. It is a proportional balancing scale, and is not only an improvement over all scales now in use, but a distinctly new idea, balancing planer knives endways, at the same time balancing the total weight, thus speedily obtaining a perfect balance, a thing never accomplished by any scales formerly in use. The necessity of having the ends in balance is appreciated by all good mechanics, and is essential for safety, good work and preservation of the machine. There are scales in use that balance the total weight and by another long and tedious manipulation the ends are then balanced, but, in balancing the knives endways, they almost invariably destroy the total balance, and vice versa. It matters not which operation you do first. The proportional balancing scales obviates all this. It is as sensitive as a druggist's scale, simple, accurately balanced, with all the bearings of hardened steel. The invention is well worth investigation, and THE RECORD suggests that manufacturers send for circular and price.

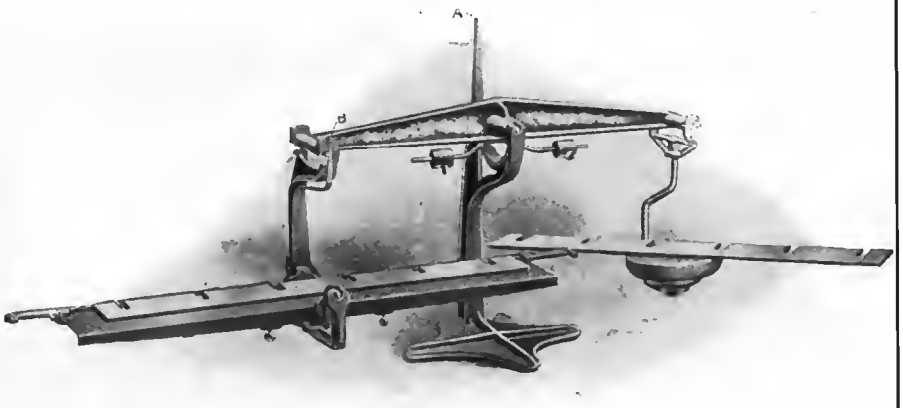
Baldwin, Tuthill & Bolton advertised it in their elaborate 1905 catalog with a detailed How-To-Description of the 'Perfect Way,' but this time with their company name across the beam. The balances sold like hot cakes. (Fig 14, 15, 16 & 17) Its claim to fame was then: *The Only Balancer that will Balance Endways and Total Weight at Same Time. It saves time, labor, repairs, knives, machines and money.*

Fig 14. ⋏⋏ Balance Scale catalog, Baldwin, Tuthill & Bolton, Grand Rapids, Michigan, 1905. Compliments HathiTrust Digital Library, Ann Arbor, MI.

Fig. 15. ➢➢ *Balance Scale catalog Baldwin, Tuthill & Bolton*, Grand Rapids, Mich. catalog, 1910.
Collection Grand Rapids Public Library.

The Only Balancer that will Balance Endways and Total Weight at Same Time

It Saves Time, Labor, Repairs, Knives, Machines, Money.



No. 104, Proportional Balance Scale $20. Capacity 41-inch Knives.

Boxed 12x12x37 inch. Weight, 150 lbs. boxed. Code word, Balanced.
No. 104A $25. Capacity 60-inch Knives.

Slides "C" "C" will instantly and correctly center any knife from 41 inches down and slides move but 3 inches.

Pointer "A" will show if one knife is heavier than the other.

Pointer "B" will show if one end of the knife is heavier than the other and indicate which end. For a correct balance both of the errors must be corrected.

Will do its work from one-third to one-tenth the time of any other balance.

This machine will balance planer knives ENDWAYS, at the SAME TIME balancing the TOTAL WEIGHT, and thus speedily obtaining a perfect balance; a thing rarely or never accomplished in any scales formerly in use. The necessity of having the ends in balance is appreciated by all good mechanics, and is essential for safety, good work, and the preservation of the machine. For years machines have been sped higher and higher, and demand more perfect balancing of knives. In using the PROPORTIONAL BALANCE SCALE draw the slides "C" "C" apart, then place the largest knife in the center of tilting platform, push the slides "C" "C" together, and it instantly centers the knife. Then tighten thumb screw on the back and they will remain in the same position, and will need no further attention. The slides "C" "C" are inversely connected, and instantly and correctly center any knife from 41 inches down, and the slides do not move over three inches. The pointer "B" indicates the heavy end, how much variation there is. Correct this and then place this knife on the tilting platform. Pointer "A" shows how much heavier this knife is than the other, and pointer "B" shows where the additional weight is located. If "B" indicates one end heavier than the other, reduce that end until "B" is in the center, then reduce evenly until "A" indicates correctly. If there are three or four knives in set, proceed the same as with second knife. It is a very exceptional case when it will be necessary to go over the knife a second time. Place the knife on the platform as shown in the cut, and always place every knife the same way. Knives should be of exact length, and work from left end; i. e., place the left end of knife in same place on the platform, and then on cylinder. Line them from same end. These machines are as sensitive as a druggists' scales, are simple, all parts are accurately balanced, all the bearings are of hardened steel, and other parts of machine are made of steel, malleable or cast iron, as the case demands.

Fig. 16. ≺≺ Key to photo in Fig. 17 below. Balance Scale catalog Baldwin, Tuthill & Bolton, Grand Rapids, Mich. catalog 1910. Collection Grand Rapids Public Library.

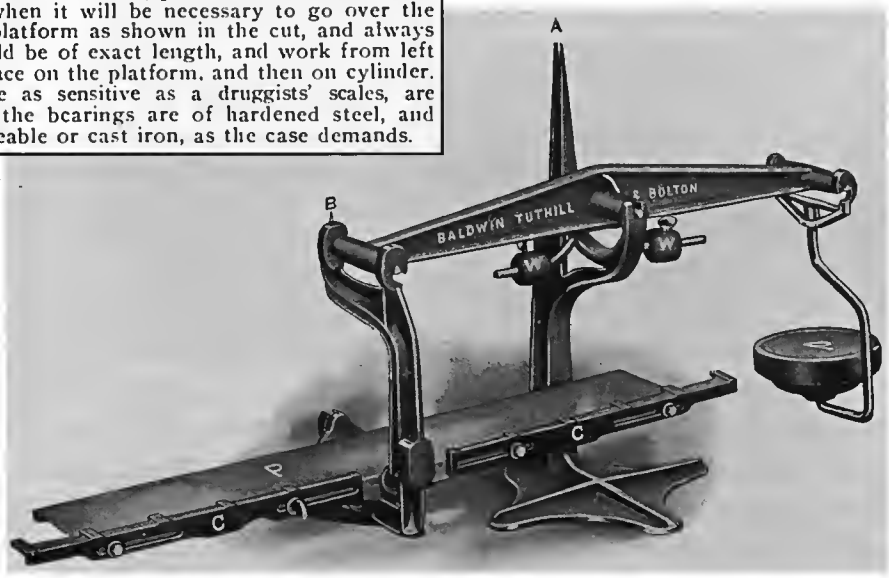


Fig. 17. ➢➢ Balance Scale catalog Baldwin, Tuthill & Bolton, Grand Rapids, Mich. catalog, 1910. Collection Grand Rapids Public Library.

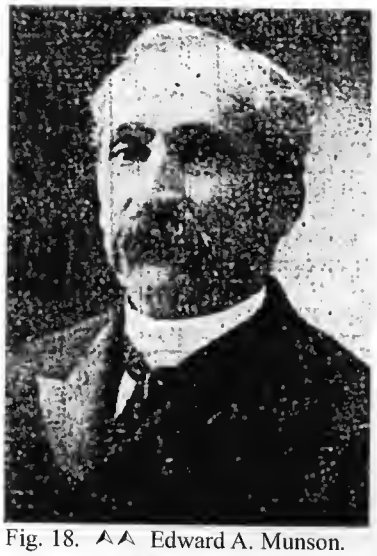


Fig. 18. AA Edward A. Munson.

Let's see how this success influenced Edward's life. For a while he continued making edge tools, but in 1902 he started under the firm name Munson Co. to manufacture machine knives on Mills Street[6] , employing three men. Tragedy struck shortly thereafter, as we can read in his obituary in the Evening Press on November 7, 1902[7].

> While inspecting the work of placing the roof of his new factory building on Mill street, about 5 o'clock yesterday afternoon, Edward A. Munson (Fig. 18) had a sudden attack of heart trouble and fell in a unconscious condition. Contractor W. E. Ames was with him at the time and summoned the police ambulance. The unconscious man was at once removed to his residence 331 Crescent avenue, and Dr. DuBois summoned, but Mr. Munson had passed away before the arrival of the doctor.

His wife Harriet seems to have taken over the business with son Ray as the manager of the Munson Company in 1903, then 25 years old. In the1910 census, Harriett is listed as manufacturer machines; the business still flourished, the balance still highly advertised in the Baldwin, Tuthill & Bolton catalog.

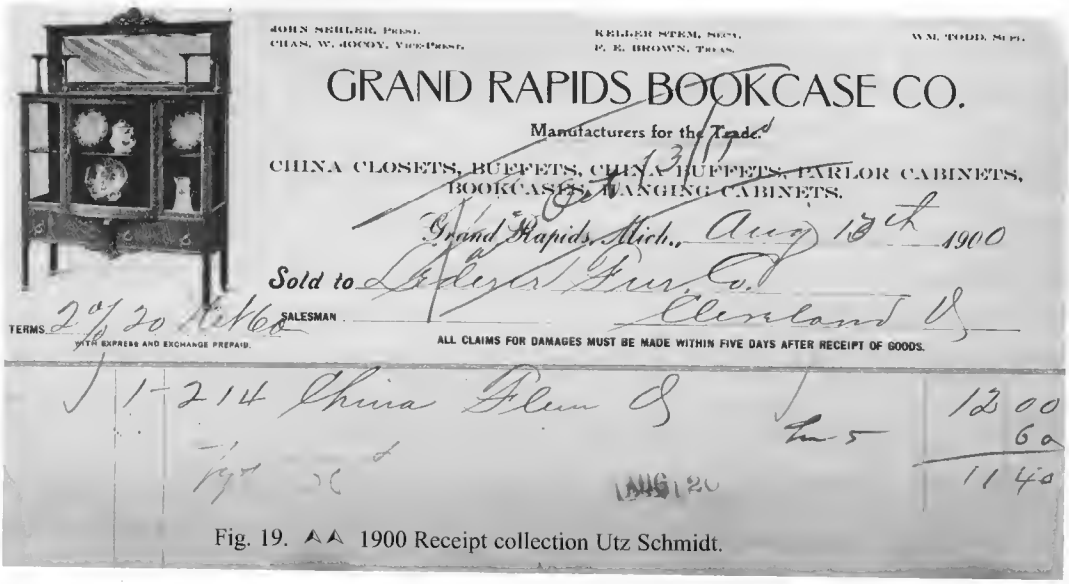


Fig. 19. AA 1900 Receipt collection Utz Schmidt.

The author thinks that all these ingenious balances helped to propel the Grand Rapids furniture industry to rank #1, the *Furniture Capital of America*. Everyone's needs could be satisfied with furnishings for all purposes. An example is the China Fleur sold in 1900 to the Lederer Furniture Company for just $11.40. (Fig.19) Let's finish the article with a picture from another piece of furniture in the Grand Rapids Public Museum. (Fig. 20)

References:

1. Massie, Larry, *Voyages into Michigan's Past,* Avery Color Studios, Au Train, Michigan, 1988.
2. 1880, 1900, 1903 & 1910 US Censuses, Grand Rapids on Edward A. Munson.
3. Grand Rapids Furniture Record, 28 Oct 1884 (p. 2) - Grand Rapids Public Library, History and Special Collections Dept.
4. Baldwin, Tuthill & Bolton, *B.T. & B. Saw and Knife Fitting Machinery and Tools: Machinery for Saw Mills*, Grand Rapids, Mich. 1905 & 1910.
5. *Michigan Tradesman*, 25 Feb 1901, p.249. Grand Rapids Public Library, History and Special Collections Dept.
6. 33rd Annual Report 1916 - Michigan Department of Labor
7. *Evening Press,* 07 Nov 1902, (now, *Grand Rapids Press*). Grand Rapids Public Library, History and Special Collections Dept.

Acknowledgements:

My sincere thanks go to Steve Beare and Ella Klein for their contributions and Greg Moss for editing.

Fig. 20. AA

The Covel-Hanchett Scale

BY KURT BEYREIS

I recently obtained the scale shown in Figures 1 & 2. I have not been able to find any references to this balance in any patents, catalogs, ads or articles. After some discussions with collectors of antique woodworking machinery we concluded that it was manufactured in house and used as a shop scale in the Covel-Hanchett plant to compare the weight of knives, gibs (think of a metal shim to hold the knives in position) and bolts to keep the head in balance. The scale itself weighs about 20 lbs. and has a capacity of about 30 lbs. It has hardened steel knife edges with sensitivity in the 1 gram range.

Figure 1.

History of the Covel-Hanchett Company and its Antecedents, Descendants and Partners

In about 1876, W. L. Covel Company was established in Chicago as a manufacturing plant of saw sharpening machines, later known as the Chicago Covel Manufacturing Co. and then the Covel Manufacturing Co in 1906, when it was moved to Benton Harbor, Michigan.

John Hanchett founded the Hanchett Swage Works in 1889, and set up shop in Big Rapids, Michigan. Hanchett's patent for a hand swage in 1891, became an industry standard for many years. A swage is a hand tool for sharping both band and circular saws.

In 1916 The Machinery Company of America was established in Grand Rapids, Michigan as a distributor for Covel, Hanchett and Baldwin, Tuthill & Bolton (which was another manufacturer of sharping machinery that was established in 1889, by the three men). By 1928, the company's name was changed to the Covel-Hanchett Company. In about 1945, the company was purchased by the Hanchett Manufacturing Company. Hanchett Manufacturing Inc. is still operating today in Big Rapids, Michigan producing knife and saw sharpening systems among other products.

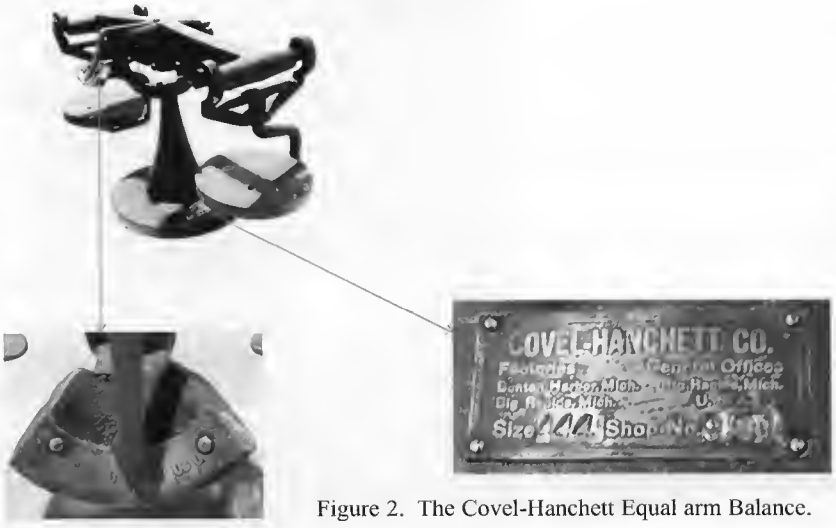
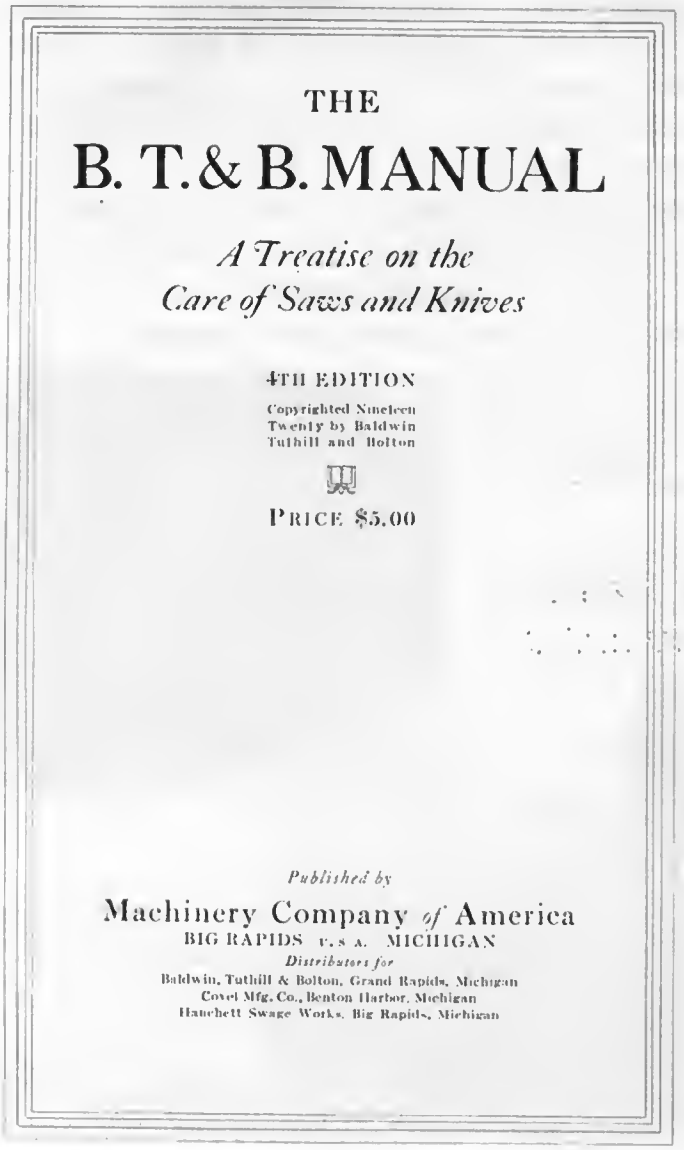


Figure 2. The Covel-Hanchett Equal arm Balance.

The Machinery Company of America published *A Treatise on the Care of Saws and Knives* (The title page of the 4th edition is shown in figure 3).

This manual was a standard for woodworkers for many years and has been updated and was reprinted many times. This manual was originally put together by Baldwin, Tuthill & Bolton around 1904. It was first listed in the "CATALOG OF COPYRIGHT ENTRIES" published by the Library of Congress Copyright office on July 7, 1910.



THE

B. T. & B. MANUAL

A Treatise on the Care of Saws and Knives

4TH EDITION

Copyrighted Nineteen Twenty by Baldwin Tuthill and Bolton

PRICE $5.00

Published by

Machinery Company *of* America

BIG RAPIDS U. S. A. MICHIGAN

Distributors for

Baldwin, Tuthill & Bolton, Grand Rapids, Michigan

Covel Mfg. Co., Benton Harbor, Michigan

Hanchett Swage Works, Big Rapids, Michigan

Figure 3.

On page 187, the book points out that as little as an ounce difference in the weight of the knives in the running balance will convert that difference into an unbalanced force of nearly 60 pounds in a rapidly rotating set of knives. This will very quickly wear the bearings out of round and causes vibration to the machine and will require time consuming, costly repairs to put the machine back to specifications. With the modern day high speed grinders and sharpening systems, as little as a tenth of a gram out of balance can cause serious problems.

Since the late 1800's, two commercial knife balancing tools/scales have dominated the market from their introduction until after WWII. They are the Defiance Proportional Knife Balance, patented in 1882, (well documented by Cliff Lushbough's article in Issue #4 of the 2004 EQM) and the Proportional Weighing Apparatus patented by Munson in 1896. (Again well presented by Utz Schmidt in this issue of EQM on pages 4028 to 4033.) A 1923 catalog indicated that the Defiance balance had sold 5000 units in the previous several years. Schmidt, in his article, mentions that during the early 1900s, the Munson patent Balance "sold like hot cakes". It is interesting that while the Munson balance was more sophisticated and easier to obtain accurate results than the Defiance balance, both sold very well. Both balances were listed in the early 1930s Covel-Hanchett catalogs.

When you examine both the Covel-Hanchett and the Munson balances as shown in figures 4a & b, there are several design features that are very similar. These include the hanging pan design and the zero adjusters on the post. Despite these similarities, I doubt they were manufactured by the same company.

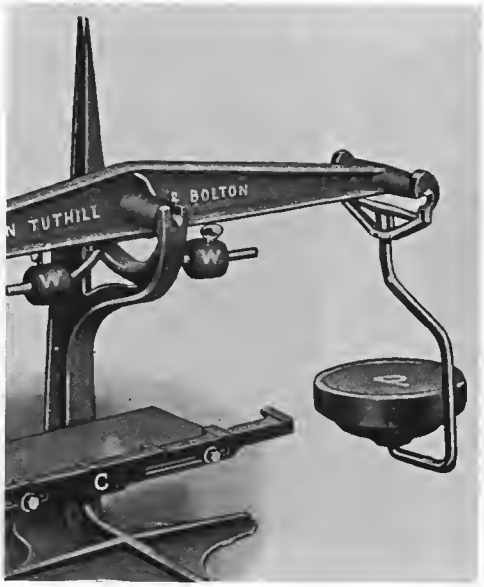


Figure 4a. Munson Proportional Balance.

Figure 4b. Covel-Hanchett Scale

Figure 5.

I also had the opportunity for Daniel Warner, the historian of an antique woodworking site, to walk me through the process of making a curved arch molding for either a doorway or a window. His antique equipment was not ultra-high speed; the knives were balanced on an Exact Weight over/under scale as shown in Figure 5.

Also, since the blades were opposite each other in pairs, each pair was only required to be balanced against the other pair in order to keep the head in rotational balance. Figure 6 shows the six place head used to hold the knives. The "moulderman" (machine operator) would balance the knives and then do the cutting of the piece. Figures 7 and 8 respectively show the partially finished molding and the final completed product.

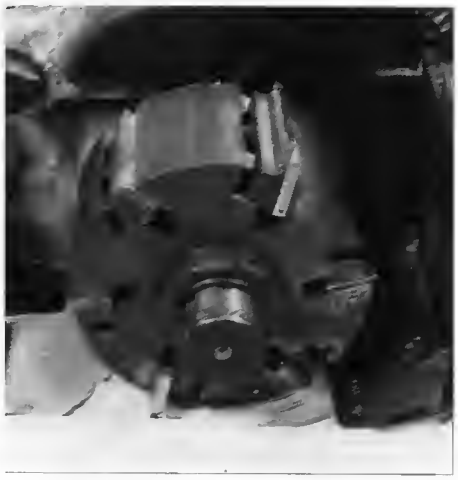


Figure 6.

Figure 7.

Figure 8.

Figure 9 illustrates another head and is a four slot type that was used around 1900, in the slower rotational speed machines available at that time.

Of further interest is the knife blade shown in figure 10. This massive blade was used to scoop out the familiar seat on wooden chairs in order to make it more comfortable than a flat seat. Knives of this design were used extensively in furniture production.

Acknowledgements:

I would like to thank Daniel Warner for his help in educating me about the saw and knife sharpening industry. I would also like to thank Utz Schmidt and Cliff Lushbough for giving me a lot of background for this article. Finally and most importantly, thanks to my wife Ann who proofread and corrected my mistakes.

Figure 9.

Figure 10.

Single-coin Rockers and Their Lack of Markings

BY MICHAEL FOSTER

Single-coin rockers of the 18th and early 19th century generally lacked any of the maker marks or distinguishing features that might be used to help identify their possible makers or retailers.

Except for the initials which are sometimes found on the poise of single-coin rockers from the 1700s, there are few markings or distinguishing features to be found.

If there are initials present, the question that arises is whose initials are they, the maker, the retailer or perhaps the owner? This is an important question to try and answer when attempting to identify a possible maker or retailer of a rocker. Unfortunately, as will be shown, there is little certainty when dealing with these rockers.

The author has access to two very rare and unusual single-coin "elongated-poise" rockers with the 'WI' stamp on the poise. The two rockers will be used as a basis for this discussion which is intended to illustrate some of the problems with identifying the makers of the early single-coin rockers.

These two rockers appear to be of an "early" style and were at first thought to be from the 1710 to 1780 time frame. Is it possible to narrow down this range?

Rocker 1 is a half-moidore rocker with a distinctive 'WI' stamp on the poise:

Rocker 1. ➢➢ Top: Half-Moidore Elongated-poise rocker.

Rocker 1. ➢➢ Side: Half-Moidore Elongated-poise rocker.

Rocker 1. ➢➢ Half-Moidore Elongated-poise rocker.

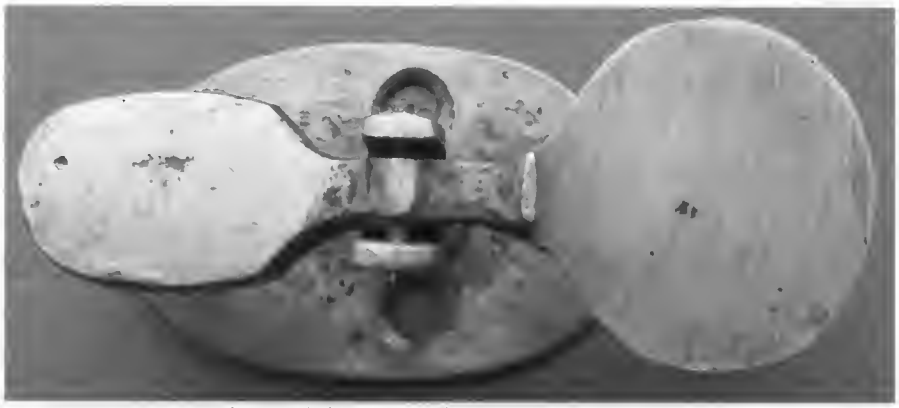
Dimensions: Beam Length: 50 mm, Platter: 22x20 mm, Base: 47x22 mm, Pivot Height: 26 mm.

Because of the large amount of trade with Portugal after England's trade treaty in 1703 and the acceptance of new world Portuguese gold coin (moidore and half-moidore) in payment, Portuguese gold was found in general circulation in addition to British Mint gold coinage (guinea and half-guinea) up to the Great Recoinage Law of 1816.

Particularly in the West Country parts of Britian, Portuguese gold almost completely displaced the insufficient coinage of guineas from the Royal Mint. The moidore was valued at 27 Shillings for a weight of 6 dwt 22 grains. The half-moidore at 13 Shillings and 6 pence for a weight of 3 dwt 11 grains. In 1742, the moidores of Portugal were described by Rev. Peter Vallavine, vicar of Monkton, as being *in great measure the current coin of the Kingdom.*

As the Portuguese coins began to wear and were clipped, the need for coin weights or some means to test the coins became necessary. Perhaps in response to an outbreak of clipping of gold coins in the 1730s, some of the first moidore coin weights were created in England. As discussed in Withers's, *Coin Weights,* the 1746 to 1748 period saw several issues of "dated" coin weights for testing the moidore, indicating an increased demand for gold coin testing.

British single-coin rockers that test the weight of the moidore and half-moidore were most likely made and introduced in the West Country sometime in the period 1730 to 1750. The first were perhaps simple unnamed and unlabelled two column rockers with a column for the poise rest and a second to hold the pivot holes and bearing points, shown as Rocker 2.



Rocker 2. ⅄⅄ Top: Half-Moidore poise rest rocker.

Rocker 2. ⅄⅄ Side: Half-Moidore poise rest rocker.

Rocker 2. ⅄⅄ Half-Moidore poise rest rocker.

Dimensions: Beam Length: 54.5 mm, Platter: 22 x 21.5 mm, Base: 37 x 24.5 mm, Pivot Height: 26 mm.

By the 1760s gold coinage circulating in Britian consisted mainly of heavily worn Portuguese coin and guineas. A number of Acts dealing with Light Coin were legislated between 1773 and 1775. The most effective feature of the Acts was the re-introduction of a *Least Current Weight* for gold coin in circulation.

This specified a minimum weight below which a coin was not acceptable and was only worth its metal or scrap value. To prevent coins being clipped to this minimum value, the Act specified that any coin which had been damaged by clipping or had been otherwise reduced, even if still above the minimum legal weight, was only acceptable as scrap. Light coin was to be withdrawn from circulation.

In 1773 the moidore was valued at 27 Shillings for a Least Current Weight of 6 dwt 22 grains to 6 dwt 22¼ grains. The author's testing has shown that Rocker 1 tests for a weight of 3 dwt 11 grains, the official Least Current Weight of a gold half-moidore after 1773.

Portuguese Gold

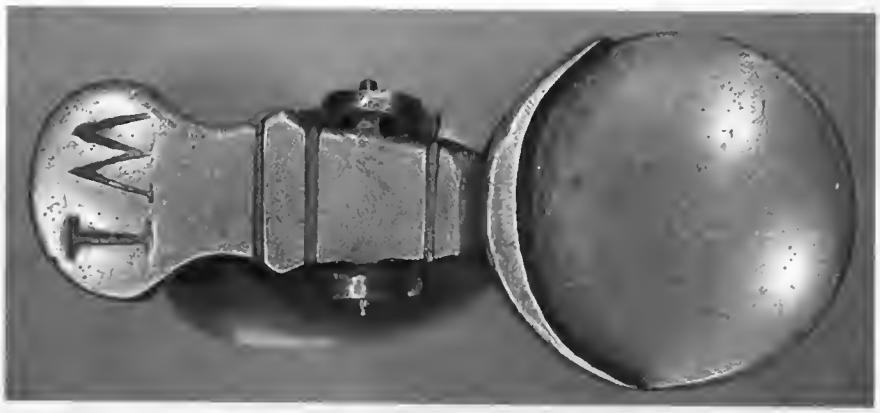
DENOMINATION		MINT PERIOD	Least Current Weight (1773 on)			DIA	GOLD FINENESS
			gm	grains		mm	
Moidore	27S	to 1732	10.77	166.25	6DW 221/4GR		0.917
½ Moidore	13S 6D	to 1732	5.39	83.125	3DW 111/8GR	~19	0.917
¼ Moidore	6S 9D	to 1732	2.69	41.563	1DW 17 1/2GR	-	0.917

British Gold

DENOMINATION		MINT PERIOD	MINT WEIGHT		Least Current Weight (1774 on)	DIA	GOLD FINENESS
			gm	grains		mm	
Guinea	21S	1760-1816	8.40	129.63	5DW 8GR	24	0.9145
Half-Guinea	10S 6D	1760-1816	4.2	64.82	2DW 16GR	20-21	0.9145
1/3 Guinea	7S	1797-1816	2.8	43.21	1DW 18GR	17	0.9145

The immediate withdrawal of all light guineas would have been disastrous for trade, so it was decided that the withdrawal would be gradual and guineas issued before 1760, were allowed to continue in circulation for a period if they weighed 123 grains or more. A coin issued between 1760 and 1771 had to weigh at least 126 grains to be acceptable. Those struck after 1771, had to weigh 128 grains or more to remain in circulation. This compares to the full legal weight of 129.6 grains.

Rocker 3 is a half-guinea rocker also with the 'WI' stamp on the poise, made perhaps in the 1760 to 1816 time frame:



Rocker 3. Top: Half-Guinea Elongated-poise rocker.

Rocker 3. Side: Half-Guinea Elongated-poise rocker.

Rocker 3. Half-Guinea Elongated-poise rocker.

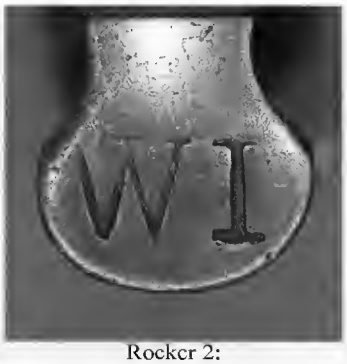
Dimensions: Beam Length: 50 mm, Platter: 22 x 20 mm, Base: 30 x 20 mm, Pivot Height: 30 mm.

The author's tests have shown that Rocker 3 was made to test the British gold half-guinea to the Least Current Weight of 2 dwt 16 grains set by Royal Proclamation in 1774.

The beam, pivot and platter are very similar on Rocker 1 and 3. The decorative elements of the elongated-poise and the column styles are different on each but could have been made by the same maker.

Both have the same size 'WI' initials stamped on the poise, but in different orientations, made with very similar "letter" die stamps except for some degree of wear.

Rocker 1:
Half-Moidore 'WI' on poise.



Rocker 2:
Half-Guinea 'WI' on poise.

The 'WI' stamp link between the two rockers perhaps implies some degree of commonality on their dates of manufacturing or use, potentially having the same maker, retailer or even owner. This may limit the possible years of their manufacture, sale and/or use in this case to the overlap period 1750 to 1780. During this period there were numerous warnings to the public to check the weight of their gold coinage to the Least Current Weight. Perhaps the incentive for the making of these single-coin guinea and moidore rockers?

Rocker 4: Half-Guinea 'BK' on poise.

Without more clues determining who "WI" might have been is very difficult. Looking at the Crawforth Index there is no obvious or simple choice for a "WI' scale-maker during the time period.

Rocker 4 is a similar half-guinea rocker to Rocker 3 but with the letters 'BK' on the poise likely made in the same time frame: Close inspection of Rocker 4 photos reveals differences in the poise and column shape and assembly versus Rocker 3. Was this rocker made by the same maker for a different retailer or owner, whoever the 'BK' was? It seems likely that it was made by a different maker than Rocker 3, however, the author has no record of the current owner of the rocker or its dimensions to help with any additional identification or linkage to Rocker 3.

Rocker 4 Top: Half-Guinea Elongated-poise rocker.

Rocker 4:
Half-Guinea Elongated-poise rocker

Could the 'WI' labelling on Rocker 1 and 3 be for the owner of these rockers? Owner's names are sometimes found engraved or stamped on sovereign rockers, often put there by the maker perhaps as part of the sale offering. A possible explanation is the initials represent a banking or financial institution that made use of the rockers for testing coin. They might use a rocker for faster testing and would label the rocker as their prop-

erty. If "WI" is a banking institution the possible commonality of dates of manufacture and use is less apparent. The problem is to identify whose initials they are, to provide leads towards a possible maker, retailer or even owner or institution.

Labelling of the poise with a maker or retailer name or initials appears to be uncommon on the later single-coin guinea rockers. Only the original buyer would know who made or sold it.

Rocker 5, a moidore rocker made by Thomas Pyke (successor to Street and Pyke), brass worker, clock maker, scales and weight maker, of Bridgwater, Somerset from 1773-1811, is an example of a known maker's labelling:

Rocker 5: Moidore
'T.PYKE / B.WATER' on poise.

Rocker 5 Top: Moidore rocker made by T. Pyke of Bridgwater

Rocker 5 Side:
Moidore rocker made by T. Pyke of Bridgwater.

Rocker 5: Moidore rocker made by T. Pyke of Bridgwater.

Dimensions: Beam Length: 55 mm, Platter: 24x23 mm, Base: 55x30 mm, Pivot Height: 36 mm.

Pyke was an early user of a Crown stamp maker mark on his rockers. One version of his mark, a Crown on an incuse-field GR, is seen on the poise of Rocker 5 along with his name 'T.PYKE' and business location 'B.WATER'. This same crown is found on a coin weight for the Guinea issued in 1775, to the New Standard weight of 5 dwt: 8 gr by Street and Pyke.

Rocker 5. T. Pyke Crown on an Incuse-Field GR.

A handheld version of this Moidore rocker, Rocker 6, used a similar poise, platter and platter labelling but had a different incuse Crowned GR on the poise:

Rocker 6: Handheld Moidore 'T.PYKE / B.WATER' on poise

Rocker 6 Side: Handheld Moidore rocker made by T. Pyke of Bridgwater

Rocker 6: T. Pyke Incuse Crowned GR

An example of a possible retailer labelled guinea rocker is Rocker 7, most likely made by Thomas Pyke based on the platter and base style, but with the letters 'G.FREETH' stamped on an unusual shaped poise. If the rocker was made by T. Pyke then who was G. FREETH? As retailers often wanted only their name on a rocker they were selling, it is quite possible that G. Freeth was the retailer of this Pyke made guinea rocker:

Rocker 7 Side: Guinea rocker most likely made by T. Pyke of Bridgwater

Rocker 7: Guinea rocker with G. FREETH on poise

Dimensions: Beam Length: 50 mm, Platter: 23 x 22 mm, Base: 55 x 28 mm, Pivot Height: 37 mm

The platter in this case is the same style as Rocker 5 and 6 but slightly smaller for the guinea. The base is also slightly smaller as is the beam length. The larger poise area provides room for the "G. FREETH" stamp. Who G. Freeth was may never be known.

A last example, Rocker 8, is typical of an elongated-poise single-coin half-guinea rocker made to test to the LCW set in 1774, with no marks visible on the rocker.

Rocker 8 Top: Half-Guinea Elongated-poise rocker
Dimensions: Beam Length: 53 mm, Platter: 23x20 mm, Base: 33x22 mm, Pivot Height: 26 mm

This rocker could have been made anytime after 1774. The lack of any labelling or maker marks makes it extremely difficult to determine anything more about it.

What can we conclude from all this? Without a name or business location on the rocker to use as clues, it is extremely difficult to narrow the period of likely manufacture which could help with the identification of possible makers or retailers.

At first glance the 'WI' rockers based on their testing gold coins to the Least Current Weights for Moidores and Guineas set in 1773-4 could have been made in the the 1770-80 time frame when demand for scales and balances to test gold coinage to the LCW was high.

However, the style and labelling of the rockers was more typical of an earlier period, 1730-50, when demand for coin weights suggest a period of increased gold coin testing.

Rocker 8 Side: Half-Guinea Elongated-poise rocker

Without anything else to go on, we will have to wait for newly discovered examples to perhaps get more clues to some of the unknown makers of the 18th century Moidore and Guinea Single-coin rockers.

A Unique Dutch Letter Scale

BY REIN KOK

"Maul" is a famous name among the European scale-collectors. It's a well-known scale-maker at Hamburg Germany. The logo of this firm you see in figure 1. Fixed on this Maul frame-work is a Dutch letter scale. It bears the name FORTUNA b.s.a. (figure 2). b.s.a.= Blikman en Sartorius, Amsterdam. This firm produces graphic materials,printing matters etc.

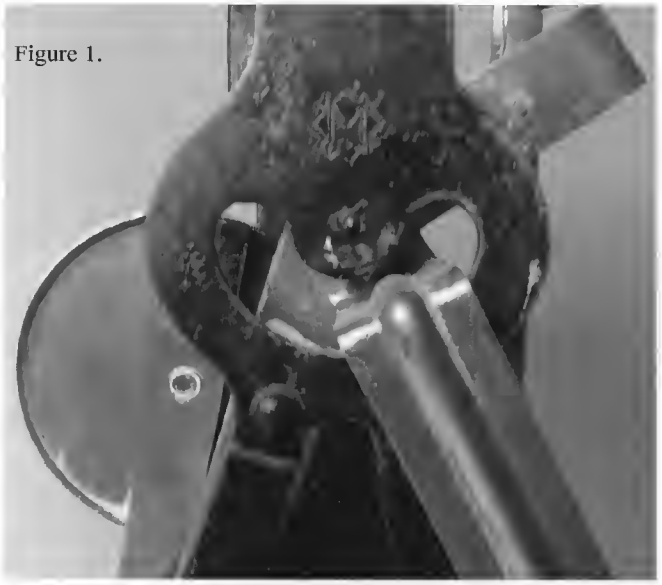


Figure 1.

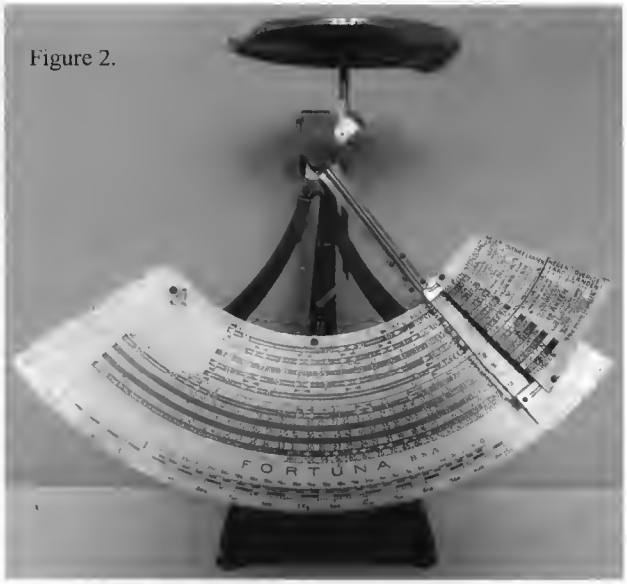


Figure 2.

Fixed at the pointer is a kind of a thin metal "flag" with the names of different postal items and their destinations. The "flag" has the same print as the beginning of the dial (figure 3). When the pointer moves along the dial it's difficult to see what lane of rates you have to use. Now it's easier and prevents mistakes. Figure 4 shows the other end of the dial. At the far end is the arm of the counterpoise. On this arm are two small rounds on which are a Roman "I" and "II".

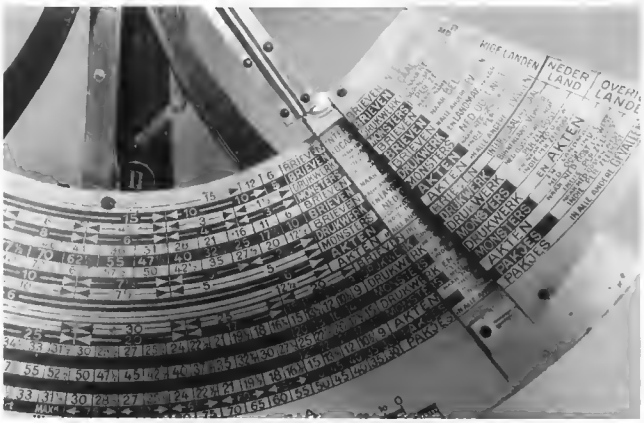


Figure 3.

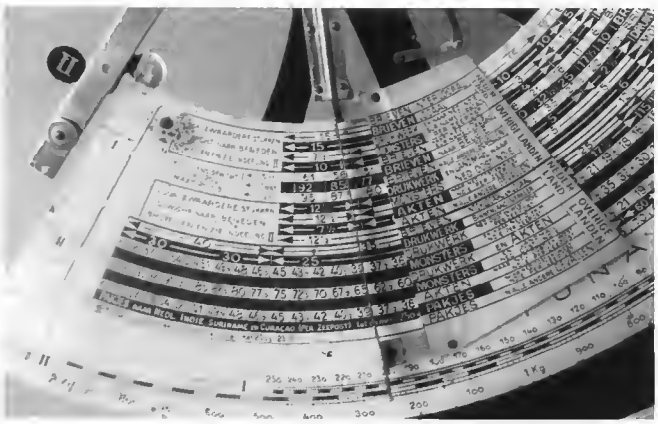


Figure 4.

Editor's Note:

Translation as shown on the dial on figures 3 & 4: Brieven=Letters, Drukwerk=Printed Matter, Monsters=Samples, Akten=Deeds and Pakjes=Packets.

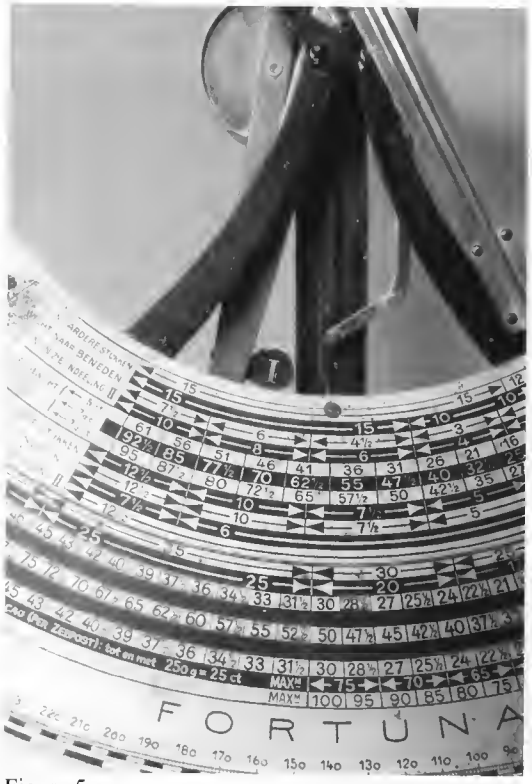


Figure 5.

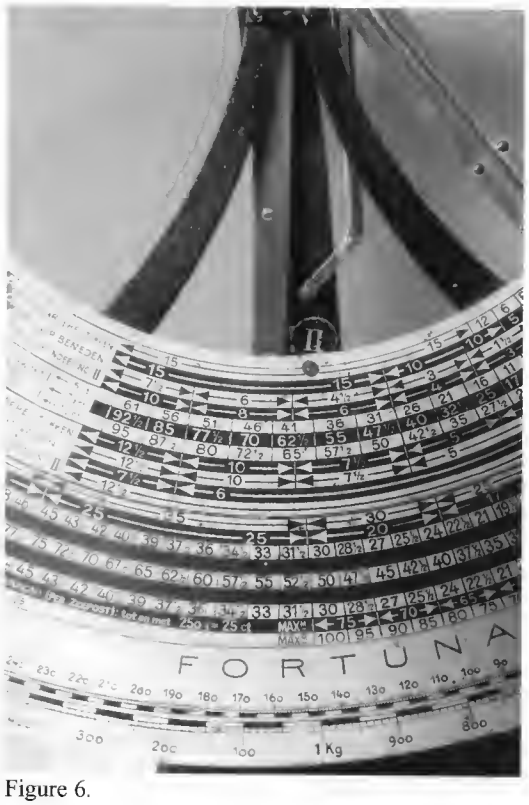


Figure 6.

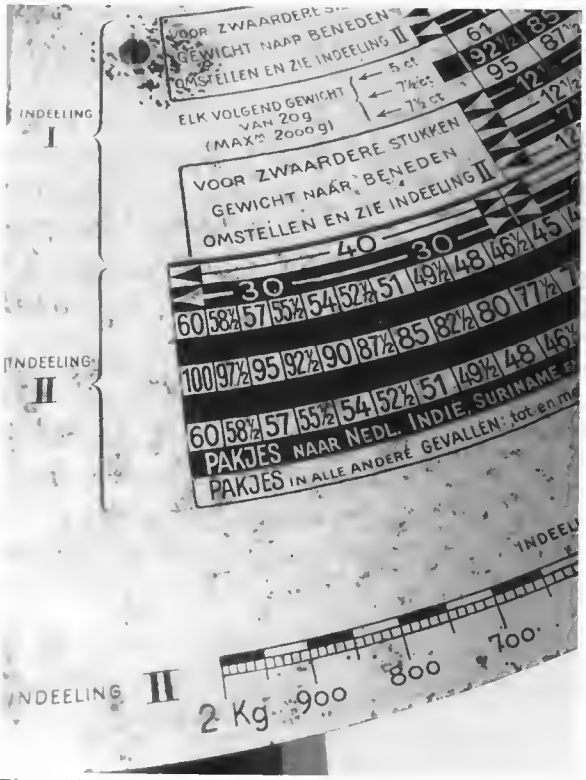


Figure 7.

When the counterpoise is at the top then you have to use the rates in the upper part of the dial; the roman "I" peeps above the dial (figure 5). With the counterpoise in its lowest position then the roman "II" appears above the dial (figure 6). In figure 7 is the explanation how to use "I" and "II" : *voor zwaardere stukken gewicht naar beneden omstellen en zie indeeling "II"* that means *For heavier items counterpoise down and see classification "II"*. The dial is suspended from the frame-work. The rates are dated of ca 1935. The measurements of the dial are; upper part 22 cm,lower part 44 cm and height 12 cm. The scale is graduated from 0 - 250 and 250-2000 (2 kg) grams. The pedestial is 14,5 x 11 x 1 cm and the total height of the scale is 34,5 cm.

A Type of English Fish Scale

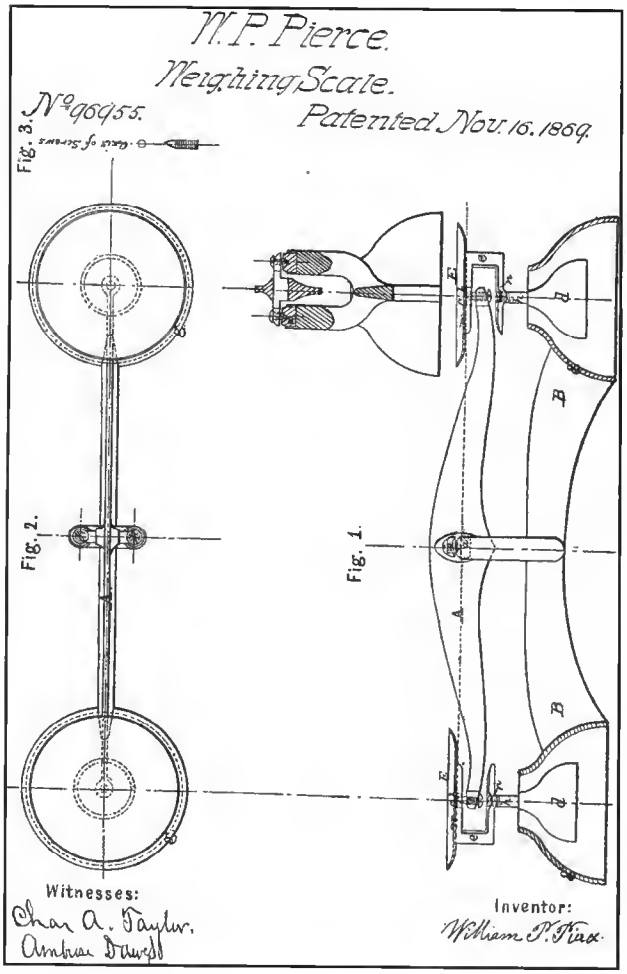
BY KURT BEYREIS

When I first saw the scale pictured above, it looked like an ordinary round faced store scale . However, on closer inspection, there is a logo with a picture of Isaak Walton who was the author of *The Compleat Angler* in 1653. The logo is surrounded by fishing gear indicating that it was a fishing scale. The aluminum cased scale made by Reuben Heaton and Sons. LTD has a zero adjustment on the side to accommodate a wide range of baskets and pans for the individual fisherman or for club contest use. This scale has an 8 pound capacity by ¼ ounce. When I first saw an English fishing scale I didn't recognize it as such because it measured down to drams and fractional ounces and therefore could not be a fish scale. However, I learned that the fish in English rivers and streams often were very small and many of the fishing contests could be decided by one or two drams as opposed to US contests that mostly decided by pounds and occasionally in close matches by the pounds and ounces.

Reuben Heaton founded the company in 1857, which later became Reuben Heaton and Sons. LTD. He was a very keen fisherman and his company was dedicated to producing high end fishing equipment, including fish weighing scales, both for their own sales as well as wholesaling to competitors. This scale with the Isaak Walton logo was produced by the company starting in about 1930, and became one of their best selling products. This particular scale was probably made in the late 1950s or 1960s, around the time the company moved to Two Gates, Tamworth.

Today the company operates as REUBEN HEATON and still mainly produces a wide selection of fishing tackle and scales as well as other products. The round faced Isaak Walton logo scale is still sold today with only minor changes from the 1930 design.

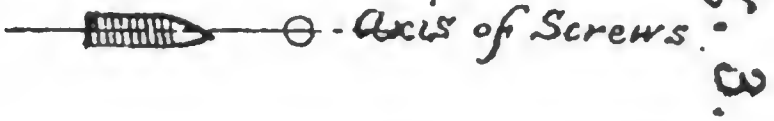
Patently Interesting



Patent number 96955 was issued to William P. Pierce of New York, New York, on November 16, 1869 for a Weighing Scale. The main idea behind this patent is the replacement of the standard steel knife edges, found on most balance scales, with eccentric screws. Pierce claimed in his patent *for the purpose of providing great facility of nice adjustment of points.* Figure 3, enlarged below, shows *a magnified section of screw in order to show eccentricity of point of screw.*

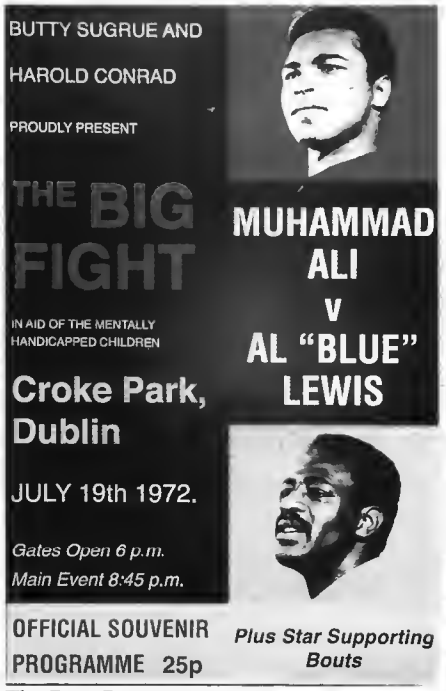
The patent model, shown below measures 10 inches wide by 2½ inches tall and is made of brass. It is accompanied by an old patent model tag.

Les Schneiderman Collection.



Scales and Sports

BY PADDY WHYTE



The Bout Programme.

One of the greatest sporting events ever staged in Ireland, which captured the imagination of the entire nation, was when World heavyweight boxing champion Muhammad Ali stepped into the ring against Al Blue Lewis, in Dublin, July 19th. 1972. On arrival at Dublin Airport, Ali confirmed that his maternal grandfather, Abe Grady emigrated from Ireland in the 1860s and settled in New Orleans. This sent electric waves of enthusiasm to the proceedings which lasted for days. I had the privilege of a ring-side seat to watch Ali defeat Al Blue on a technical 11th round knock out. The memory of this occasion is so special for me personally for two reasons:

(1) In my youth I joined the local boxing club, winning six of my amateur bouts and crowned County champion of my weight division before an abrupt end to my career due to a nasty injury. However, my interest in this great sport never waned, and I attended numerous amateur and professional tournaments all over Ireland and Europe over the space of the years.

(2) My company BERKEL Ireland, on the night of the big fight, had the privilege and honour of supplying the scale for the official weigh-in. Both Berkel and I derived great sales publicity from the photo shots. Muhammad Ali left a legacy in Ireland that has been acknowledged by the sporting press for the history books.

Ali on Berkel scale, Angelo Dundee (Manager from 1960- 1980) wearing glasses, Michael "Butty" Sugure promoter, behind Ali.

ISASC

EQUILIBRIUM®

QUARTERLY MAGAZINE OF THE INTERNATIONAL SOCIETY OF ANTIQUE SCALE COLLECTORS

2014 ISSUE NO. 3 PAGES 4049 - 4076

Cover Picture

This static coin scale by Anscheutz & Co was numbered 1565, and did not weigh the rare huge gold coin valued at £3..12..0. It has been photographed with the lid wide open, so it was not preventing the pillar from dropping backwards. Note the cut-away bottom of the pillar, which left a space for the pan when it swung round and down with a 36/- coin in the pan. The company was run by Valentine Anscheutz and John Schlaff on Denmark St., Soho, as listed in London trade directories betwcen 1761 and 1781. A Johannis, moidore, guinea or one of their subdivisions were placed in the pan, which swung the quadrant round until the scale balanced.

The scale folds flat into the mahogany box which is but ½" thick. The polished brass pillar and pan contrast with the silver plated quadrant and blue lining.

The label affixed to the box reads *INSTRUCTIONS for using the INDEX BALANCE. When the box is open raise, the Balance perpendicular, and flap the top of the box against the handle til it rests upon the pin, then move the index to the first line before the piece of money is put into the scale.* Private Collection.

Contents

Historically Important Scale at Brook Museum, Ashford, Kent, UK
Mike Sharpe 4051-4052

Anscheutz and Schlaff
Andrew Crawforth &
Diana Crawforth-Hitchins 4053-4060

Showcase 4060

Advertising Scales
Ben Smith 4061-4067

Showcase 4067

Book Review 4068-4069

WARRANTED STEEL BUSH'D on the Poise- E. Heeley & Co.
Michael Foster 4070-4076

ISASC
INTERNATIONAL SOCIETY OF ANTIQUE SCALE COLLECTORS

EQUILIBRIUM is published quarterly in February, May, August and November.

ISSN: 0893-2883

Historically Important Scale at Brook Museum, Ashford, Kent, UK

BY MIKE SHARPE

Spring Balance by Marriott of London, made about 1848.

Near where I live there is a fascinating museum of rural life. The Curator and Trustees of Brook Agricultural Museum were kind enough to allow me to examine and dismantle one of their exhibits, prior to basic cleaning and refurbishment.

The scale is a robust weighing instrument capable of reading up to 330 pounds. It measures about 19 inches (480 millimetres/mm) from top to toe, with a dial about 12 inches (300 mm) in diameter. (Figure 1)

While it is quite heavy to handle, the obvious method of use was to suspend the scale from a hook or block firmly fixed to a support, using the upper loop. The load could then be attached to the lower eye by a hook or ropes or similar, perhaps taring off the attachments by making a mental or written note of the indication before the load was applied.

Figure 1. ≺≺ The scale before cleaning. Note the zero stop, heraldic badge and manufacturer's nameplate appear intact and original.

The clear indication of the weight is made by a steel pointer which travels clockwise from the very noticeable zero stop. The pounds are marked out on the outer circle and the stones (in this case of 8 pounds each) on the inner, so that for example '160' (pounds) corresponds to '20' (stone). (Figure 2)

Figure 2. ≻≻ The brass dial, removed from the scale, after cleaning with wire wool soaked in metal polish. The author's reflection when photographing is visible.

The accuracy of such a weighing machine may not have been exact to much more than 3 or 4 pounds. Its repeatability would however be superior to other types of scale of this high capacity, because of the elliptical type of spring resistant employed in the sealed cast iron box behind the brass dial. It also had the advantage of being self-indicating, so long as the dial had been calibrated.

This artefact is a rare example of the use of a double elliptical spring resistant. Most contemporary examples have a single spring resistant, which would give accuracy and robustness to a lower capacity. The elliptical steel spring employed in relatively high-specification engineering, such as this, required a degree of sophisticated design and manufacture. The two springs in this case are separated by what appear to be lugs or spacers, to prevent them touching and fouling each other. (Figure 3)

The manufacturer's details on the outside allow for a fairly close dating, since "89 Fleet Street" was one of several addresses associated with the London firm of Marriott. Since it has ended up in an agricultural museum, its use may have been for farm weighing. However, it would have been quite expensive due to its materials and workmanship, and its original purpose may have been for heavy trade weighing, possibly in the butchery trade, since the 8-pound so-called "London stone" was current in England in this field at that time.

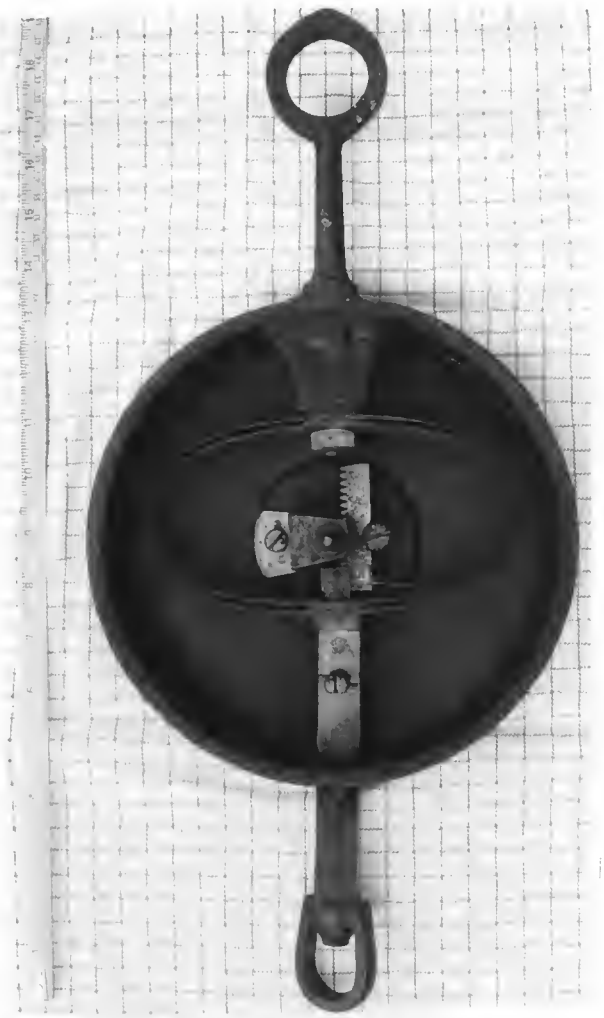


Figure 3. ⅄⅄ The scale from the front, with pointer and dial carefully removed to show inner workings.

In order to examine and photograph the springs, it was necessary to remove the steel pointer very carefully, then the dial. I used plenty of lubricating fluid and a small hub-pulling tool. The pointer is finely manufactured, incorporating a brass bush within a steel casing, and allowing for a small amount of adjustment of the indication. (Figure 4)

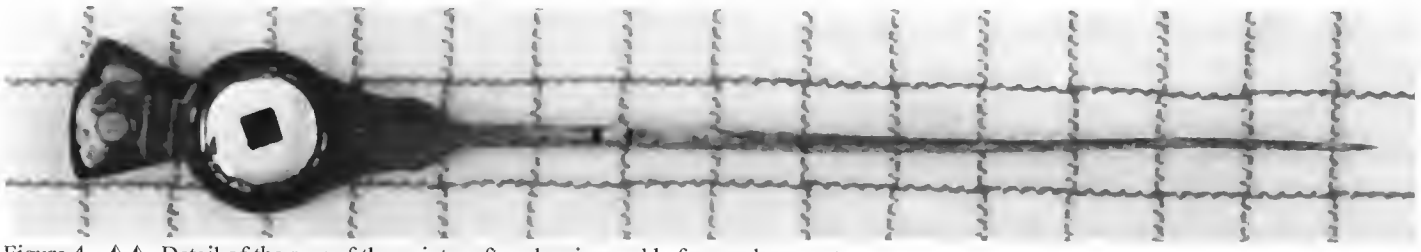


Figure 4. ⅄⅄ Detail of the rear of the pointer after cleaning and before replacement.

In researching the manufacturer of the scale, I was very grateful to Diana Crawforth-Hitchins' article from EQM 1995, No 1 (pages 1882-88) showing a number of similar scales. In the caption to Diana's Fig. 3 (page 1884) mention is made of carefully stamped numbers, significance unknown. On the rear of the brass dial I cleaned after dismantling, there was certainly '20½' stamped close to the central hole. Perhaps further examples of these interesting items might yield up evidence of a system?

Author's Biography:

Mike Sharpe has been an ISASC member since the late 1980s. He now lives in Southern England with his wife Tricia, and takes an interest in scales in museums and elsewhere which embody developments in technical progress.

Anscheutz and Schlaff

BY ANDREW CRAWFORTH & DIANA CRAWFORTH-HITCHINS

Anscheutz and Schlaff are often credited with making the first pendulum scales in England, but this is not correct. They certainly sold pendulum scales very early on in the development of pendulum scales, (as early as 1772) but other people had a prior claim.

The late Hans Jenemann pointed out that J. H. Lambert of Mulhausen, Germany, developed the first scales using the inclination (or pendulum) principle in 1758. They were made to test the salinity of brine in the salt-making industry which was of great value to that area of Germany. Lambert permitted G. F. Brander, the famous instrument maker, to make his pendulum scales, and Brander published a detailed description of them in 1771. See Figure 1.

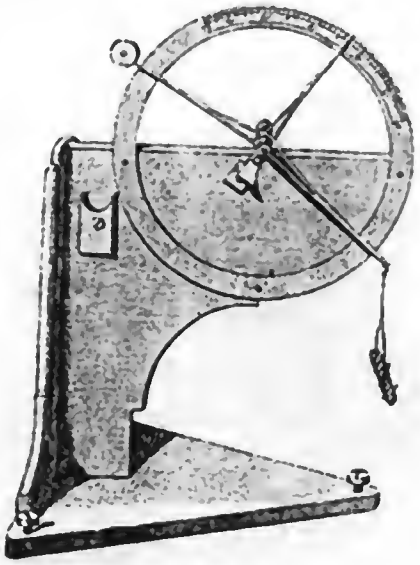


Figure 1. ≺≺ These German pendulum scales were made by Brander from 1758 on, with a moving arc. The graduations were read at the point where the plumb-line (hanging down from the centre of the wheel) crossed the arc. The lowest reading was at the right-hand side to show the least amount of salt in the brine. If the water to be tested held a greater amount of salt the float in the glass rose and the arc swung to the right. The pillar on the left had a level housed in the circular disc (behind the arc in this picture).

Figure 2. ➢➢ W. Ludlam's yarn balance of 1765 had a rugged wooden plinth with three screws to adjust its verticality, a feature needed on all pendulum scales. When not in use, the counterpoise dropped into the little cup on the left. The graduations were most widely separated towards the heavier end of the arc, so that finer readings could be taken with a larger load of woollen threads.

Although Lambert developed them in 1758, the Englishman W. Ludlam[1] credited another Englishman, Mr. Rouse of Harborough, with thinking of the idea "many years ago". Ludlam wrote this in 1765, (see Figure 2,) so, as with so many ideas, more than one person was contemplating the concept at about the same time. Both Rouse and Ludlam intended their pendulum scales to weigh tiny loads of yarn in the woollen industry.

So who thought of the use of pendulum scales to weigh coins? The credit goes to Johann Sebastian Clais of Denmark Street, London, when he got his English patent in 1772. See Figures 3a, 3b, 3c & 3d.. He sug-

A.D. 1772, April 30 – No. 1014

Clais, John Sebastian. – A new machine or engine called an Index Ballance for weighing money or any other materials without shifting the weights. According to one modification of this invention, a scale is suspended from one corner of an instrument which the patentee terms a 'square dial' and which is furnished about midway of one of its sides with a pivot or fulcrum on which it rests. The 'dial' is furnished with a graduated index, marked on two of its lower edges and a graduated sector is also fixed across it. A plumb line is suspended from the upper corner of the dial, and upon the article to be weighed being put into the scale, the dial, turning upon its fulcrum, indicates the weight of the article by means of the plumb line and graduated index.

In another modification a graduated sector is fixed to an upright pillar and two scales are suspended from a lever mounted on a fulcrum, to which is also connected a counterpoise, the counterpoise also serving as an index finger, which, on the lever being moved by the weight of the article placed in the scales, serves to indicate the amount of such weight on the graduated sector.

Other modifications are described. The leading feature of the invention is the employment of a single counterpoise and index dial instead of a number of separate weights; the dial itself in some cases, as in the modification first mentioned, serves also as counterpoise

Figure 3a. ≺≺ This abridged version of J. S. Clais' patent proves how difficult it was for new ideas to be described! Without the attached pictures, it seems probable that few readers would have understood it.

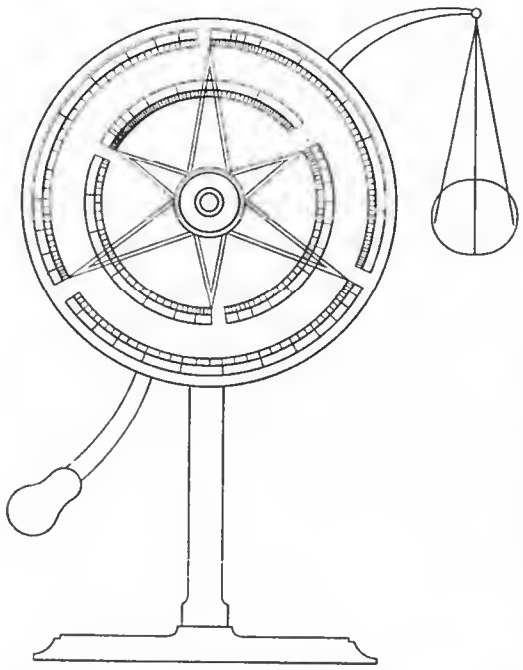


Figure 3b. ≺≺ One of Clais' ideas had six pointers and six sets of graduations, but no example of this elaboration has been seen. A version with three pointers was made for King George III (see below).

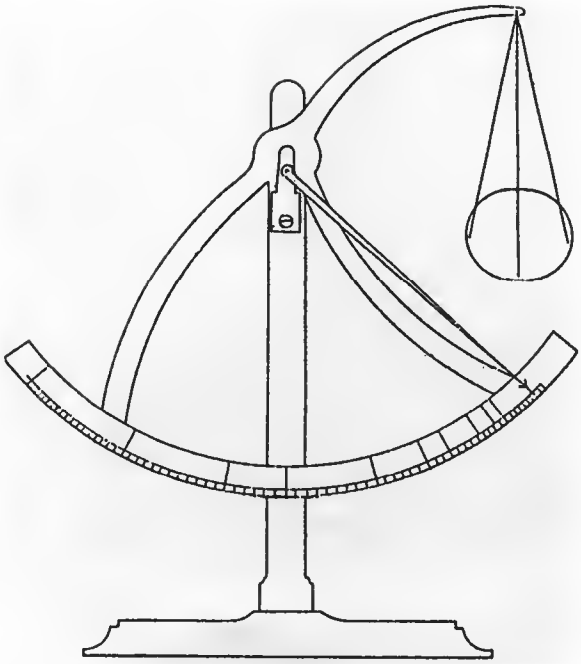


Figure 3c. ➢➢ Another of Clais' ideas was incorrectly drawn in the patent. If a load was put on the pan, the arc would be raised to the left, and no graduations would be behind the pointer! The pointer should have been drawn on the left-hand end of the graduations!

gested versions with stationary graduations and a moving pointer, and conversely, versions with moving graduations and a stationary pointer. He also suggested ones with a circular arc with six sets of graduations for six readings. Only one example of this circular version is known, that in the George III collection, made by Anscheutz and Schlaff, with graduations expressed as Value in sterling, Weight in Avoirdupois and thirdly, in Troy ounces.[2] See Figure 4.

Yeſterday a Grant paſſed the Seal of Letters Patent unto John Sebaſtian Clais, of Denmark-Street, St. Giles's in the Fields, Clockmaker, for a new-invented Machine called an Index Ballance, for weighing Money, or any other Materials, without ſhifting the Weights.

Figure 3d. ⋏⋏ This newspaper report recorded Clais as a clockmaker, but he does not appear in any lists of clockmakers in London. He was living a mile to the west of the City, but possibly he was not making clocks (having other matters to attend to for the Margrave.) The report captures the radical invention - that the weights were not shifted, so, by implication, it had direct read-out.

Figure 4. ➢➢ This grand example, based on the patent drawing in Figure 3b, was made for King George III, who was very interested in instruments for science and philosophy. It was made very early on, bearing the number 112. The left-hand graduations were in Avoirdupois, from 1 dram to 20 drams. The top graduations were for gold coins current in England, with graduations in sterling from 4/6 to £3..12..0. The lower right-hand graduations were in Troy from 0 to 20 dwts (1 oz). To set the pointers to zero, the two large black screw-heads were loosened and the small black ring slipped round the slots in the dial. The small black ring was made in one piece with the arms bearing the counterpoise and the load-pan Note the spirit-level housed below the pillar, a position conventionally used by the makers of scientific instruments, especially on pillar-mounted telescopes.

Figure 5. ➢➢ This 1782 medallion showed J S Clais later in life, when he had become an important industrialist. Note his plain dress, and his lack of a wig or powder on his hair.

The name Johann Sebastian Clais (or von Clais)[3] gives a hint as to his origins. See Figure 5. He was an exceptionally talented man from Baden who was trained as a watchmaker, and did more than the conventional travelling done by every German journeyman, to gain extra experience with other Masters. Clais was sent to Paris and then, in 1770, was sent to London. Here he made friends with Benjamin Franklin, James Watt and in particular Benjamin Huntsman, the inventor of cast steel, and his son William. Maybe Clais remembered the pendulum scales made by Brander, and adapted the idea to the weighing of coins. Maybe he thought of the idea independently when the English became so nervous about the gold coins in circulation.

Figure 6a. ➢➢ Making these very thin boxes to fit the balance exactly was a feat of carving. The larger box 175 mm long, was for the hydrostatic version. The shorter box 148 mm long, was for the static version.

However the idea occurred, Clais was unable to take advantage of his patent, because in 1772 his sponsor The Margrave Karl Friedrich of Baden ordered Clais back to Baden to help to develop his factory that was set up to produce English steel. The authors have found no evidence to explain why or how Anscheutz and Schlaff, clock-case makers and makers of cabinets in exotic woods, took over the patent. They lived in the same street as Clais, Denmark Street, Soho, London. Maybe Clais had arranged for Anscheutz & Schlaff to make the peculiarly shaped boxes, so that they were at least acquaintances. See Figure 6a & 6b. Maybe Clais gave them the patent. Maybe they paid for it.

Figure 6b. ➢➢ See Figure 9 for the contents of this version. It was made very late on, near the end of the company's work.

Figure 7. ≺≺ The hydrostatic version, no. 1832, had a clip to hold the coin. The pointer was stationary. The pointer was attached by a screw to the top of the pillar, but had a tendency to droop below the zero point on the arc, so it was necessary to push the pointer up to the left, exactly to zero, and tighten the screw before use. The silvered arc was commonly used by watch and clock-makers, but required the user to stand where light was reflected from the silver, which could be a serious problem when a candle was not available.

The quality of the pendulum scales sold with the name of Anscheutz & Schlaff, or Anscheutz & Co was of watchmakers' standard. But they were not recorded as watchmakers. Did they sub-contract a watchmaker to make the pendulum scales in their names? Did they employ a watchmaker specially to make them? See the Cover and Figures 7, 8 & 9. The authors have recorded 14 numbered scales ranging from 112 to 2090, which were probably made between 1772 and 1781. To make two thousand scales in ten years, averaging only four a week, suggests that the watchmaker had other work as well. See Figure 8.

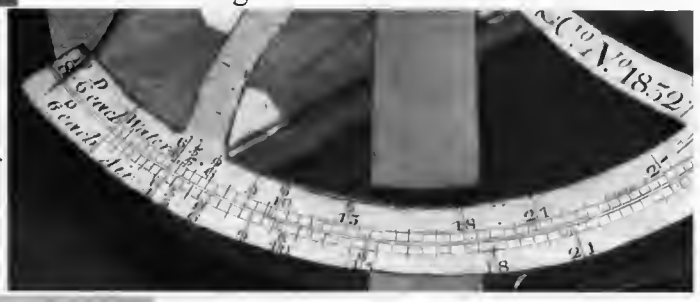


Figure 8. ≻≻ The arc of no. 1832. First the coin was weighed in air, and its weight noted on the lower graduations. Then a glass of water was raised up until the coin was submerged. Then the weight of the coin was read on the upper graduations. If the two readings agreed, the coin was of the correct fineness of gold. Note that the widest graduations were placed between 13/6 and 27/-, so that they could be accurately assessed.

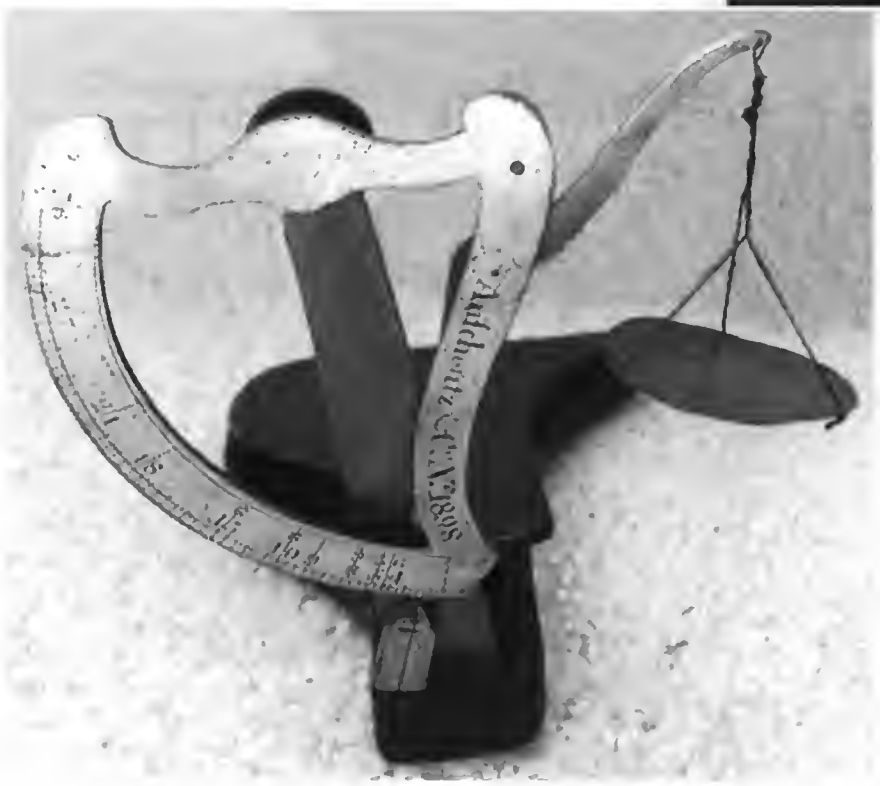


Figure 9. ≺≺ This is the only recorded example of this static version, no. 1898. The arc was fixed to the top of the pillar, and did not move. When the pan was loaded, the coin descended, and the pointer with its silvered paddle on its end, rose. Again, the widest graduations were placed between 13/- and 27/-. The graduations went from right to left.

INSTRUCTIONS
FOR USING THE
INDEX BALANCE.

WHEN the Box is open, raiſe the Balance perpendicular, and flap the Top of the Box againſt the Handle till it reſts upon the Pin, then move the Index to the firſt Line before the Piece of Money is put into the Scale.
——It is made and ſold at V. ANSCHEUTZ and J. SCHLAFF's, in Denmark-Street, Soho, London.

Figure 10a. ≺≺ Every coin scale by Anscheutz & Schlaff carried these warnings. Because the pillar was flat, it could easily drop backwards on its hinge if not braced by the box.

Figure 10b. ≻≻ The box braced the pillar, and was held there by a pin protruding from the pillar.

NEW-invented INDEX BALANCES, by his Majeſty's Patent, made by V. Anſcheutz and J. Schlaff, London, are ſold by P. DECK, Bookſeller, Poſt-Office, Bury; where may be had, Mr. Martyn's portable Steelyard for Gold Coin;---They may be alſo ſupply'd with a Treatiſe entitled, 'The monied Man's Vade Mecum,' being an Explanation of the Nature, Structure and uſe of the above Steelyard, illuſtrated by many Examples in weighing Gold Coin, and two Copper-plates, Price 6d.---Prices of the Steelyards, Braſs and Ivory, 5s. 3d.; ditto with an Index, 5 s. 9 d.

*** Light Guineas, &c. taken, and only 2d. per Grain deducted for each Grain ſhort of Weight.

Figure 11. ≺≺ At least Deck spelled Anscheutz & Schlaff correctly, even though he mis-spelled Benjamin Martin's name. He gave only the prices of Martin's coin steelyard. Perhaps he thought that customers would be put off if they knew how highly priced Anscheutz & Schlaff's were.

Anscheutz and Schlaff persuaded retailers to carry their scales, including Benjamin Martin, scientific instrument maker in Fleet St, London, Christopher Pinchbeck Junior, toymaker in Cockspur St, London, a Post Office and bookseller in Bury St Edmunds (Figure 11), a bookseller in Colchester (Figure 12), and a stationer in Reading (Figure 13). These retailers advertised the scales with the full name of Anscheutz and Schlaff, which was not a common practice. Usually retailers just advertised "coin scales" without mentioning the maker. Another surprise was discovering that both Benjamin Martin and Christopher Pinchbeck invented and made their own unusual coin scales, possibly as a consequence of seeing Anscheutz & Schlaff's balances sell well in their shops.

A SERVANT is wanted at Michaelmas next, to wait at Table, work in a Garden, drive a Pair of Horſes, and occaſionally aſſiſt in Country-Work.

Such a Servant, having had the Small-pox, and bringing a good Character from his laſt Place, may hear of a Service by applying to Mr. Keymer, Bookſeller, in Colcheſter.---If he is 30 Years of Age it will be the more agreeable.

*** The ſaid W. Keymer ſells the following Inſtruments for weighing and proving Gold Coin: The Index Balances for the Pocket or otherwiſe, made by V. Anſcheutz and J. Schlaff. --- Martin's portable Steelyard.---Hull's, Bradford's and Darby's portable Inſtrument.--Alſo Tables of the Weight and Value of Gold.

Likewiſe the new Act of Parliament paſſed this laſt Seſſion for the public Highways; alſo that for the Turnpike-Roads.---They are ſold ſeparate.

Figure 12. ≺≺ Keymer published in newspapers numerous advertisements for books and for balances. He was one of the few retailers who sold three unusual scales designs in competition, the Anscheutz & Schlaff, the Benjamin Martin and the Bradford, Darby & Hulls.

Figure 13. ≺≺ Mrs. Latier relied on her customers already being familiar with the Anscheutz & Schlaff Index Balances. Given the numerous mentions in newspapers, she was probably correct. She was the only one seen so far who gave prices.

THE PATENT INDEX BALANCES, for aſcertaining the Weight of Gold with far greater Accuracy than by any Sort of Scales, are to be ſold at Mrs. Latier's, Stationer, in Butcher Row, Reading, at 10s. 6d. 12s. and 15s.

A Trifling Trimmer* in the State,
Is like a guinea wanting weight;
Which by the index balance try'd,
Is for its lightneſs laid aſide.
Perhaps with an appearance bright,
He may deceive a ſimple wight;
A knowing one, with half an eye,
His want of ſolid worth will ſpy,
And need no ſcales to let him know
He ne'er will for a PATRIOT go.

* L—d N—h.

Figure 14. ≻≻ The Index Balance was sufficiently well-known to be used as a simile in a ditty published in 1783. A Trimmer was a person who changed sides or political parties. A wight was a living person. This ditty was about Lord North, later 2nd Earl of Guildford, a prominent politician who changed sides.

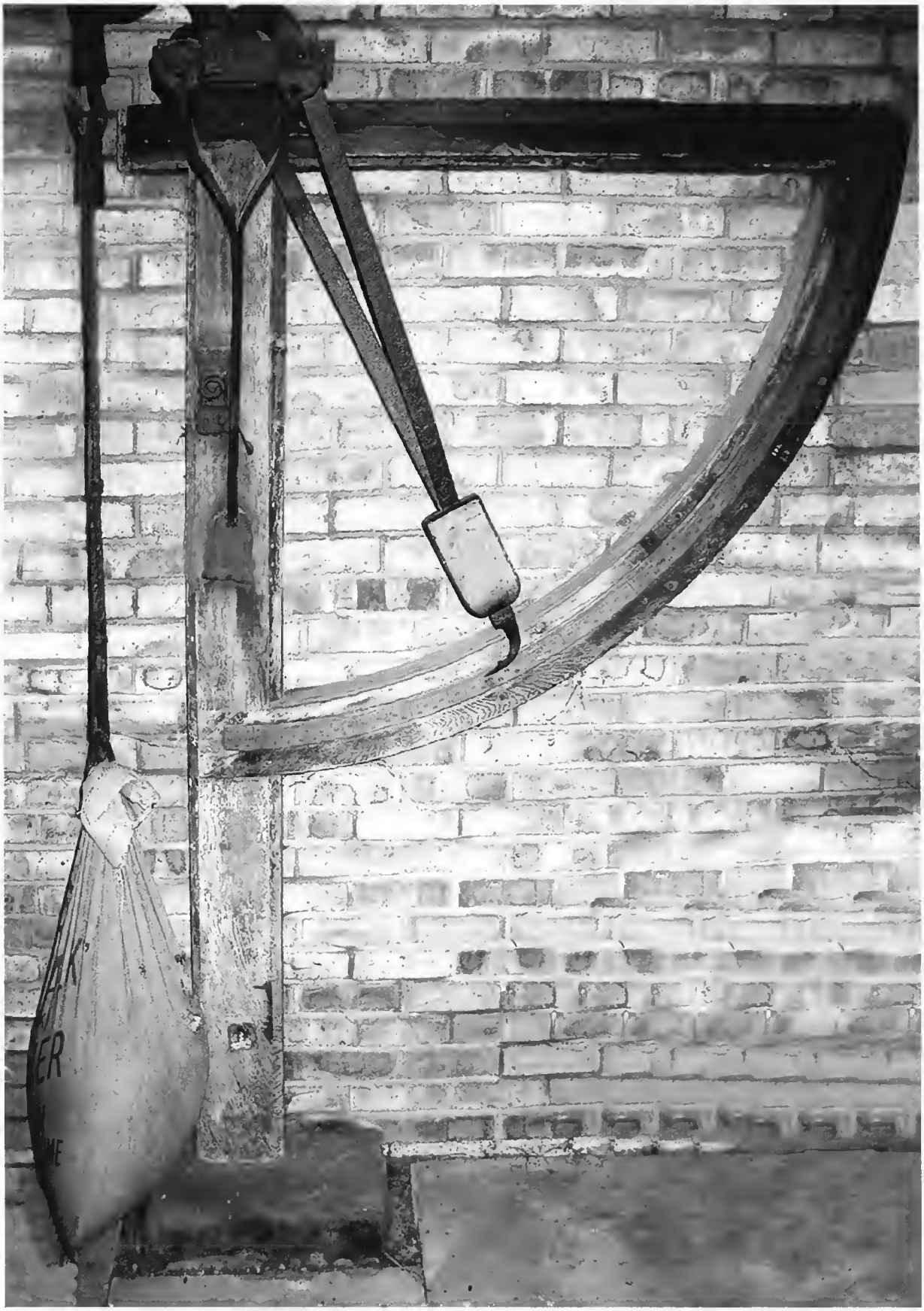


Figure 15a. ⩓⩓ The farm scale at Ripley Castle, height about 7 feet (2 metres). Capacity 2cwt. It had a fixed arc and a moving pointer. Made of wood, wrought iron, brass and lead, presumably it was not made by the maker who was making the coin scales. It is the last known number by Anscheutz & Co, no. 2090. [See also EQM 2008, issue 3, pg. 3401-3402.]

The prices were seldom advertised, and when the retailers did mention the range of prices, it is usually impossible to explain the reason for the range. In Deck's advertisement he gave the prices of Benjamin Martin's coin steelyards, those in brass and ivory at 5/3 and with an Index (that is, with a folding pointer) at 5/9. But *Martin's catalogues* offered a silver version at 8/-. This was expensive, but not as expensive as Anscheutz & Schlaffs' Index Balances, which were advertised by Mrs. Latier as ranging from 10/6 to 15/-[4]. Converted into modern costs, a 15/- balance would now cost £1,254 or $1,750 approximately. It seems incredible that about 2000 customers would pay for such expensive balances. A hint as to the type of person buying the scales by Anscheutz & Schlaff comes in a little ditty published in *The Norfolk Chronicle* in 1783 about L--d N--h. See Figure 14.

Not only did the retailers mention Anscheutz and Schlaff, they also called them a "Patent Index Balance" or even a *New Invented Index Balance by His Majesty's Patent* to distinguish it from other types of coin scales then on the market. By searching for references to an Index Balance[5], the authors were led to an auction in 1783, in which an Index Balance to weigh 2 cwt was catalogued. This was amazing. The reference in Keymer's advertisement (Figure 12) to *an Index Balance for the pocket or otherwise* might make sense if this were true.

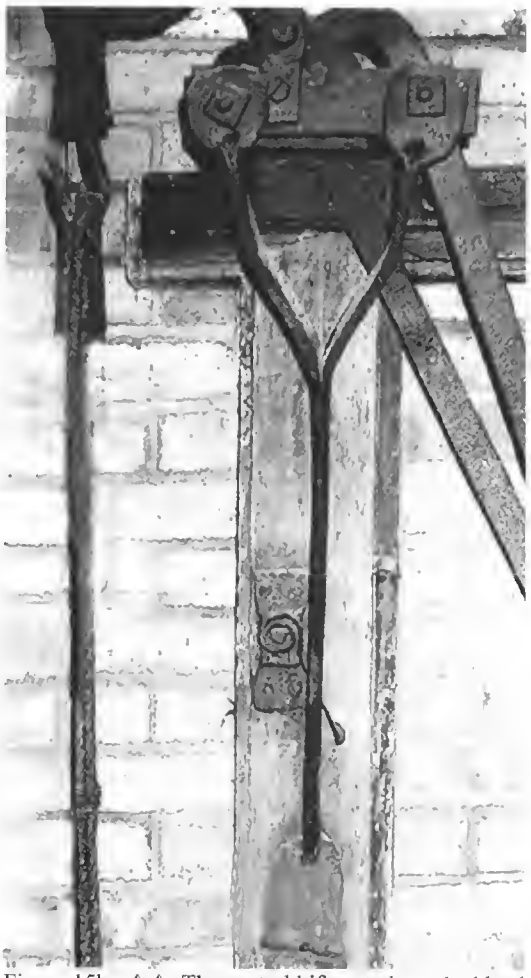
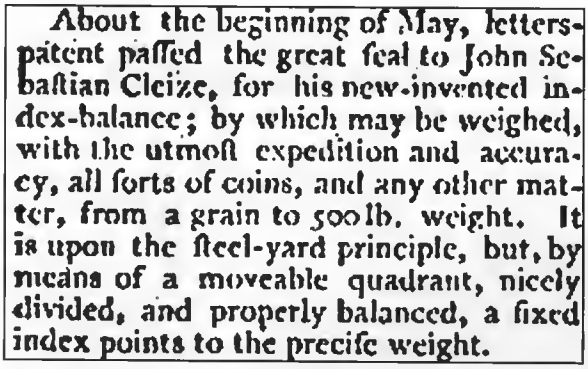


Figure 15b. ⮜⮜ The central bifurcated arm had lead at its bottom, so that it used gravity to level the mechanism. Attached to the wooden pillar near the lead, was a coiled spring to absorb the shock when the pointer returned to zero.



About the beginning of May, letters-patent paſſed the great ſeal to John Sebaſtian Cleize, for his new-invented index-balance; by which may be weighed, with the utmoſt expedition and accuracy, all ſorts of coins, and any other matter, from a grain to 500 lb. weight. It is upon the ſteel-yard principle, but, by means of a moveable quadrant, nicely divided, and properly balanced, a fixed index points to the preciſe weight.

Figure 16. ⮜⮜ If the farm balance had not been found, this comment in a newspaper in 1772 would have been very puzzling. 500 lbs (over 4 cwt) was a very different instrument from one to weigh 1 grain. The reporter would have done better to have mentioned that the beam was bent and had only one counterpoise that did not slide, so it was not a conventional steelyard.

Would any firm making little coin scales make huge versions? It seemed ridiculous, until Ken Govier sent photographs that he took at a farm museum at Ripley Castle. There was the evidence, a scale about 7 feet (2 metres) high for weighing sacks up to 2 cwt. See Figure 15a & b. Then another reference was found to Cleize [sic] patent for his balance by which may be weighed 500 lb weight. See Figure 16. Although the report described it as having a moveable quadrant and a fixed index pointer, the farm balance has a stationary quadrant and a moving pointer. Were large versions made in both variations?

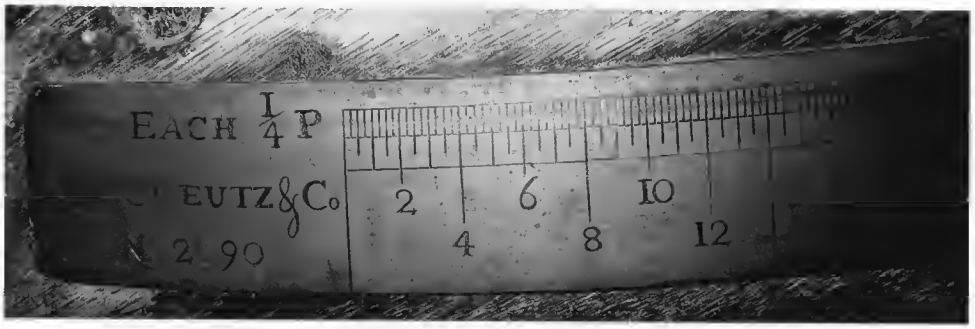


Figure 17. ➤➤ The graduations were finely engraved into ¼ pounds and stones (14 lbs each) even though this balance was intended for a farm.

It has not been possible, given inadequate documentary evidence, to state when or whether the company name changed from Anscheutz & Schlaff to Anscheutz & Co. See Figure 17. The last reference to Anscheutz and Schlaff together was 1781, although Valentine Anscheutz did not die until 1796. He left all his worldly goods to his widow Marianne and after her death to his daughter Susanna, with instructions to care for his son Godfrey, but made no reference to a surviving business, so maybe the business did not continue.

So no more pendulum scales were made for weighing coins. People could no longer buy instant read-out coin scales. They had to revert to fiddling with weights or slides. They were no longer able to buy these elegant pendulum scales that checked ten different coins so easily and accurately.

Notes & References

1. William Ludlam, *An Account of a Balance of a New Construction Supposed to be of Use in the Woollen Manufacture*, Philosophical Transactions, lv. 205, Jan, 1765. Ludlam was a clergyman, mathematician & Fellow of St John's College, Cambridge and Linacre lecturer in physic. He enjoyed a reputation for his skill in practical mechanics and astronomy, as well as for his mathematical lectures. See also *The Gentlemans' Magazine*, 1766, vol XXXVI, p 408.

2. The authors have not handled this, so further explanation cannot be given. We think the maximum capacity was 20 oz Avoir.

3. Johann Sebastian Clais was sponsored by the Margrave Karl Friedrich of Baden who, in effect, employed Clais as his agent. Clais travelled through England learning about English machinery, water management and mining, and buying machinery for the Margrave. He went on to have a rewarding, useful life in Germany, which makes fascinating reading on Wikipedia.

4. The authors have not seen examples that would explain this range in price. At that time, makers sometimes offered a relatively cheap version in a wooden box, a middling version in an ivory box, and an expensive version in a silver box. Could this explain the range from 10/- to 15/-?

5 William Winnlaw, engine-maker of London, made pendulum scales for weighing grain which were also called Index Balances. The first mention of them was in 1783, but he did not write "Newly invented" or any similar claim, so he might have made them any time after 1776 (the date of his earlier fulsome advertisements that made no mention of an Index Balance). The author owns one of Winnlaw's chondrometers, so can state that it was not the same design as that of Anscheutz & Schlaff.

Acknowledgements:

With thanks to Ken Govier, Fletcher Wallis, Guido Zavattoni and the wonderful Internet.

Showcase

A Vogue Senior Tobacco Scale with its original box. The directions on back read as follows: *Fill large cavity of scale with tobacco until far end lifts. This measures exact amount of tobacco required for a perfect Roll 5 Cigarette. Spread the measured amount of tobacco in the recess of your Roll 5 Cigarette Maker, Proceed as usual.* Made of copper-colored plastic, the rocker type scale was manufactured by R & H Products Limited, Montreal.

Advertising Scales

BY BEN SMITH

Scale collections of a diversified nature almost always have one or more scales that have been used for advertising or promotional purposes. In my case, I didn't think as much about who the advertiser was as I did about the type of scale it was or its ultimate purpose. Recent additions to my collection have piqued my interest. Because the makers name is seldom on the scale, determining who would be the recipient of the scale or the marketing method used to get it to him or her is difficult. While this presentation will be primarily devoted to Postal scales, there are many others and I will briefly touch on some of them.

Figure 1.

Figure 2.

Figure 3

Figure 4..

Postal scales used for advertising are especially interesting since one quickly discovers that there are more questions than there are answers. There are a wide variety of types, many unknown makers and a great variety of types of businesses that used them as promotional items. The Selector Postal Scales shown in figures 1 thru 4 have drawn the most interest in recent years and therefore have gotten more attention than my others.

No. 752,874. PATENTED FEB. 23, 1904.

J. M. TRINER.
WEIGHING SCALE.
APPLICATION FILED JUNE 22, 1901.

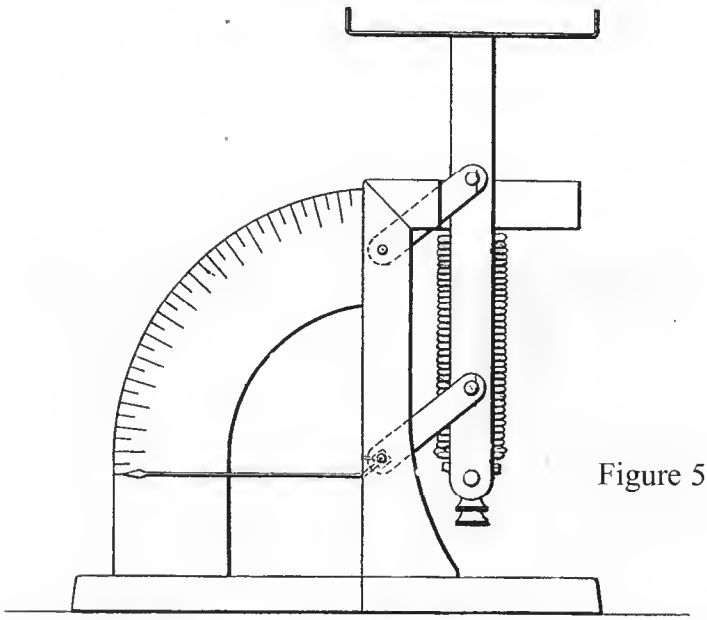


Figure 5.

The Selector Scales bear no makers name, but seem to be identical to those made by Triner under their patent number 752874 (Figure 5). While we believe they made the scale itself, the face plate and the celluloid cover were made by the J. B. Carroll Company of Chicago, who described their business as "Manufacturer of Advertising Specialties." They asserted that this item had a patent pending however in a patent search no patent was found. The earliest Selector Scales date to 1918, when airmail was first initiated and the postal rates were 2 cents for 1st class mail and 5 cents for airmail. The latest ones that I have show rates of 3 and 6 cents respectfully.

The marketing of the Selector Scales was nationwide as evidenced by the fact that my collection has scales with advertisements from California to the Carolinas and the Dakotas to Texas. This suggests that they were sold to the advertiser by a retail novelty sales company who would work out a design with their client, then place the order with the J. B. Carroll Co. who was the "jobber" or wholesaler. The Carroll Co. bought the scales from Triner, added the dial face with the approved advertisement and the celluloid cover and delivered it to either the retailer or the advertiser. The scales would be given to the advertisers customers or clients, usually around Christmas time as a thank you for past purchases with the hope for future purchases of goods or services. Often this type of "gift" would be given to the buyer's secretary as a thank you for paving the way for easy access to the buyer.

One Selector Scale of note is the one on the left in figure 1. This scale has no advertisements and gives a lot of postal information. This leads me to believe it was sold by the Carroll Co. to either Office Supply stores or to a similar retail outlet.

Another Postal Scale made by Triner with a J. B. Carroll Co. face plate is shown in figure 6. This one has a square face plate and the advertisement is on a slip-in card, which I believe to be a cheaper item. An interesting feature of this particular ad advised the recipient of the scale to "slide out the card for further information on the back side". I have not seen another scale of this type.

Figure 7 shows another type of Triner postal scale, which shows a clip-on advertisement-holder, on its letter plate. The advertiser could easily install the ad on the plate himself, but the task becomes a little more complicated when you see that the rate chart has also been replaced by one which contains the advertiser's name instead of the Triner name. This probably means that it was sold through a wholesale jobber who made the changes that made it a promotional scale for the advertiser.

Figure 6. ≺≺

Figure 7. ≺≺

Figure 8. ➢➢

One more scale that could be made by Triner is shown in figure 8. There are however some minor differences which lends some doubt to this supposition. Figure 9 shows a label on the bottom of one of these which states that they were made by Gail-Webb Manufacturing Co. of Buffalo, N.Y. This label gives directions for "zeroing" the scale. Does that mean they actually made the scale or does it mean they were the designer and maker of the advertisement on the face plate. It's just one of the questions that remains unanswered.

Figure 9. ≺≺

Figure 10. ≺≺

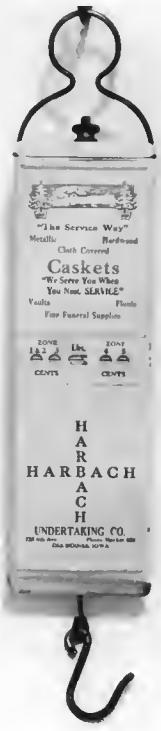


Figure 11. ➢➢

Figures 10 and 11 are of Tin Plate Spring Balances which were mostly used in the Midwestern states. These parcel scales have a capacity of 1 to 20 lbs and computed the shipping costs for parcels to various postal zones. The advertisements were printed on using washable ink and any attempt to clean them usually ends up wiping out the ad. I especially like the scale shown in figure 11 since it carries an ad from a funeral home that sells caskets and embalming fluids. I wonder what kind of customers or clients they had that would have a use for a parcel scale. It's just one of the reasons that collecting scales used for advertising is interesting.

Figure 12.

A hand held postal scale signed Eschemann & Co., Philadelphia, Pa., is shown in figure 12. It is a pendulum type scale which was patented in 1899. The letter holder on this scale is original.

The Dixie Letter Scale made by Sturgis Mfg. Co., Baltimore, Md. is a small spring balance – 5 inches long - which indicates that it has been patented but no patent has been found. It is graduated in both the imperial system and the metric system and indicates a first class postage rate of 2 cents per ounce. The advertisement is for Tho. Planz, Inc, Merchant Tailor, San Francisco. It is shown in figure 13.

The two scales shown in figure 14 were manufactured by the Thompson Eng. and Mfg., Chicago, Illinois. They look like paperweights but, when you unscrew the top part, turn it over and place it on the top of the spring-loaded graduated post they become postal scales as shown in figure 15. While only one of these scales carries an ad, both are frequently used for such purposes.

Figure 13.

Figure 14.

Figure 15.

Figure 16.

The Presto Letter Scale, Mfd. By Metal Spec., Mfg. Co. of Chicago, shown in figure 16, shows a first class letter rate of 3 cents and a capacity of 5 ounces. It may be a poorly designed scale because the letter being weighed rests against the side of the slot which may cause an inaccurate reading. This scale was probably sold directly to the retailer whose order also included specs for the ad which could be easily applied by the maker.

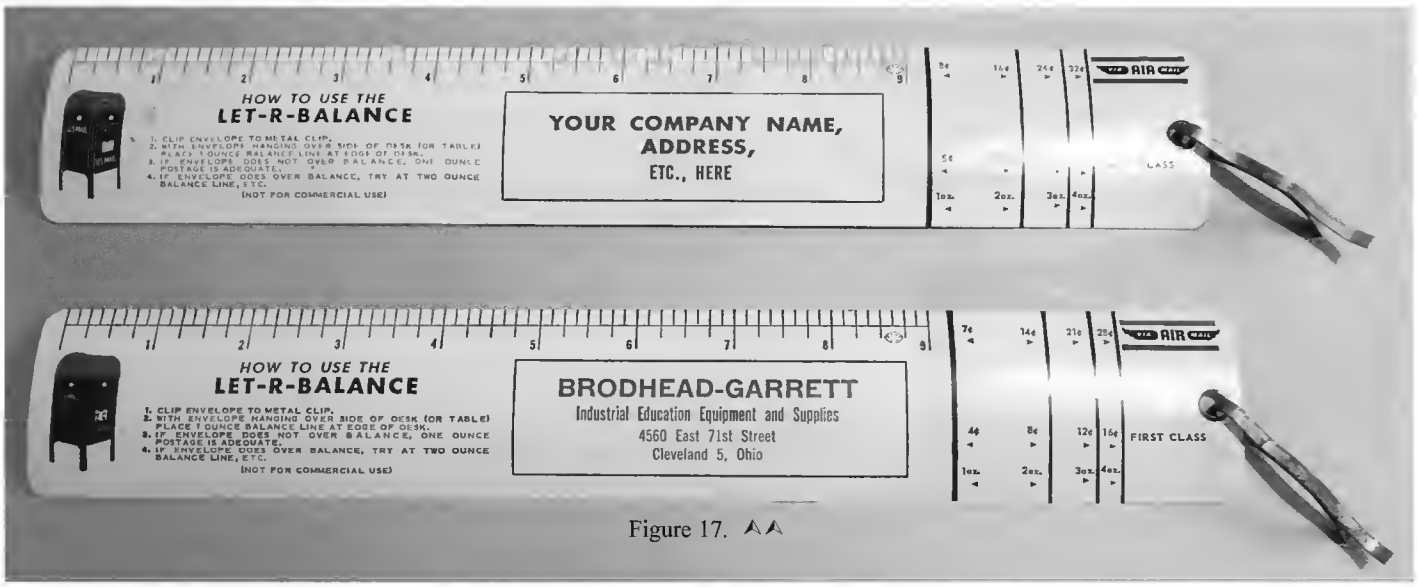


Figure 17.

The last postal scale for this article is the LET-R-BALANCE shown in figure 17. This is a very simple desk top table edge scale which is lined to show the fulcrum points for 1, 2, 3 and 4 ounce letters. One was used by the salesman to show the prospective purchaser a very inexpensive way to keep his name before his clients or customers since it also serves as a ruler or straight edge.


Figure 18.

Candy Scales such as the Wrigley Chewing Gum Scales shown in figure 18, were probably given to wholesalers to pass on to their customers at their discretion and would have ended up in Candy Stores or other retailers with large candy counters. These pictured scales were made by Triner but it is unclear as to who may have actually made the "Wrigley" dial or or the smaller ad beneath the dial. There are other types of Wrigley Scales made by other manufacturers such as the one shown in figure 19.

Figure 19. ≺≺ Larry Press collection.

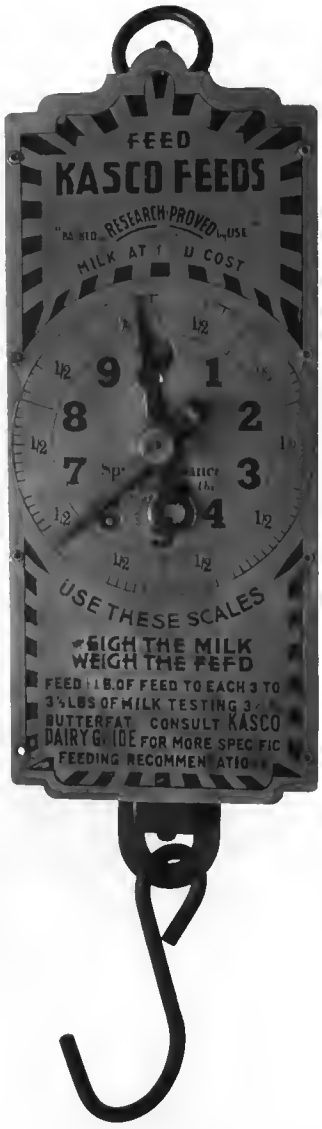


Figure 20. ⋏⋏

Milk and Scoop Scales were used by manufacturers of feed fed to farm animals and were given by the manufacturer to their retail dealers. The dealers gave them to farmers when large orders, say a ton or more, were placed. Milk Scales such as the one in figure 20, were given to dairy farmers to assist them in ascertaining the productivity and profitability of each of their cows. Scoop Scales like the one shown in figure 21 were used to mix the right amount of the supplemental feed to a recommended amount of grain. The actual maker of these scales is unknown and there are several feed companies that used similar scales.

Figure 21. ≺≺

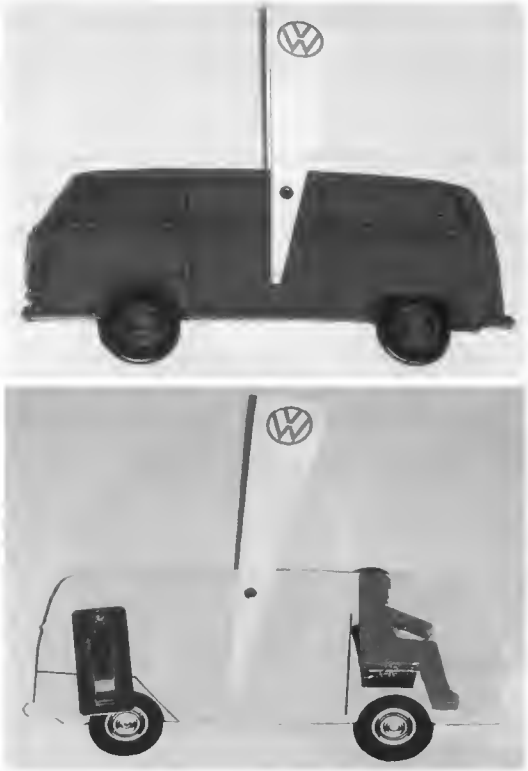
Figure 22. ⋎⋎

The last scale that I am using in this presentation is a Mellen's Food Scale which is shown in figure 22. This scale dates to the 1890's, and it came with the sample bottle of their foods for infants and invalids. It is interesting to note that the ownership of the scale remained with Mellin Foods which leads me to believe that it was placed in doctors' offices or pediatric clinics to encourage the doctor to promote their food. The actual manufacturer of the scale is unknown.

In conclusion, it should be noted that this is not much more than an introduction to collecting Advertising Scales. There were many more ways in which scales were used in this manner. For example, Jiffy Way Egg Scales were marketed under many names. Pelouze made a type of Postal Scales that were marketed by Office Supply outlets such as Weis. Charles of The Ritz marketed a cosmetic scale under their name but which was actually made by Troemner. The list goes on and on. Needless to say I still avidly seek Advertising Scales.

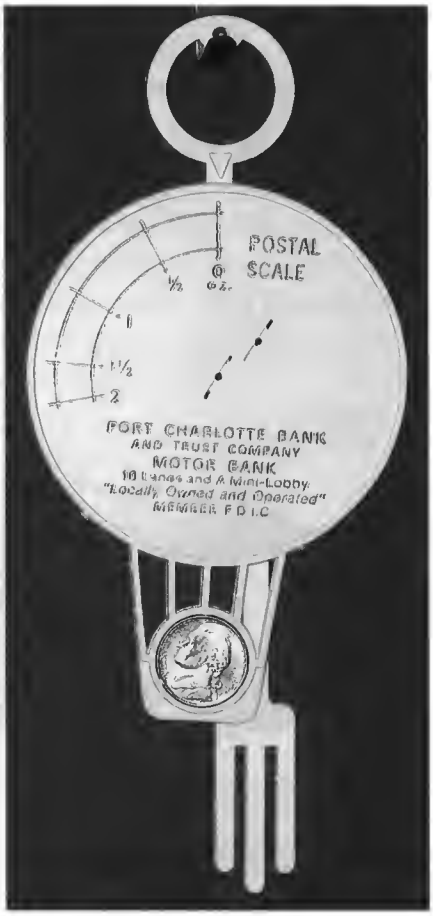
Showcase

Charles of the Ritz scales were manufactured by Henry Troemner for use in up-scale department stores' cosemetic departments to weigh loose face powder which was then blended and sold in the little pink & white boxes shown here. These scales are made of clear lucite with nickle plated beams, poises and pans. While their primary use was to weigh the powder, they also advertised it. The beam and pan should have matching numbers.



This plastic pendulum letter scale was manufactured in Germany to advertise the VW bus. The white triangle was the fulcrum by which the user held the scale. The driver is made of cast metal and acts as the counter poise to the letter which is clipped vertically on the back. It is made to weigh a 20 gram letter, the standard in Germany.

This plastic spring postal was used as an advertisement for Ciba, a prescription drug manufacturing company.



This hot air balloon shaped plastic pendulum letter scale uses a US nickle for its counterpoise. Banks and insurance companies were common advertisers on postal scales.

Book Review

Late Antiquity Weights - The Second Life of Antique and Late Antiquity Coins by Klaus Weber.

In 2009 Klaus Weber's article, *Byzantine coin weights, material about weights for 1 Nomisma*, (translated title) was published in the German journal of *Maß und Gewicht* (Measure and Weight) as a unique and large compilation and analysis of this type of weights. People paid more attention to these weights in the recent years and started adding them to their collection. The publication by Klaus Weber became a standard for these weights and is often cited.

In his earlier writings, Weber made remarks about a very special group of weights of the late antiquity: weights made from demonetized coins. Many of those belong to the group of 1 Nomisma weights. The mere existence of such weights may have been recognized by the scientific audience, but a fundamental analysis of the backgrounds was absent. So, very often the weights have not been recognized at all.

Occasionally coinage is offered in trade with initially unexplained manifestations. However, on closer examination, frequently features of an antique manipulation can be found. Often this is about trimming of the flan, engravings, carvings and edge machining of a different kind. The craftsmanship of this is quite different. Besides true works of art, there are many amateur examples. Basically, however, the modifying of weights seems to have occurred under exclusion of the administration. Possibly only compliance with the weight standards was subject to the usual monitoring. (Weber, Spätantike Gewichte, p. 5)

Klaus Weber now closes this loophole. In the publication, *Weights of the late antiquity – the second life of coins of antiquity and late antiquity*, 182 examples, an impressive quantity, mainly uncatalogued until now, are described and classified. The article covers a large spectrum of coins modified to weights dating from the Greek times until the time of the crusaders -- with an astonishing diversity of working methods of the craftsmen.

The host coins used can roughly be attributed to three eras: 1. the Greek time between 350 and 200 BC, 2. a Roman period with a peak between 300 and 350 AD, and 3. a Byzantine time between 500 and 700 AD. The exact date of fabricating the coins into weights remains most often uncertain, as the coins have been circulated over very long periods after their minting. In fact, such weights may be found in all four areas of collections: "coin scrap," filed, scratched, or "coin reworked in antiquity." So collectors, keep your eyes open to find these rarities.

EX. 1

EX. 2

Ex. 3.

Ex. 4.

The purpose of the modification was obviously the change from coin to weight. The way to reach this followed very individual possibilities: From the complete removal of all coin-properties through filing or chiseling (Ex. 1), through a kind of new interpretation while conserving existing properties (Ex. 2), up to the tentative introduction of smaller traces while largely retaining the original character of the coin (Ex. 3 and 4).

Forensically exciting is the interpretation of the tool marks found on the coin as an indication of the weight system: How many edge notches exist? Into which mass system does this number fit?

A simple and comprehensive answer is also given to the dispute "Weight, or a token or a game piece." Weights are usually made of metal; tokens are not. Tokens do not need to correspond to a mass system; weights have to. So in case we have a metal object, with a mass of 4.4 g, it is more likely to be a weight instead of a token.

Like the previous work on the 1-Nomisma weights, Weber's publication on weights of the late antiquity, made from demonetized coins, is culturally and historically important. It gives a unique, comprehensive description and analysis of a phenomenon at the borderline between weight and coin. The book is a classic eye-opener that makes the reader quickly familiar with a previously unknown phenomenon. The pieces are not parts of coins; they are coins which had a second life as a weight. This is probably of no interest for the collector who places great value on perfect condition, but it is an exciting item for those who see coins as historical documents and children of their time -- and definitely for the weight enthusiast.

Marcus Stauber

The book is available through the German Society, Maß und Gewicht, Verein für Metrologie e.V.

136 pages. Sales price in USA is $40. Mailing + PayPal = $13.50. European sales price is 29€.

Orders from M&G can be sent to versand@mass-und-gewicht.de ; the PayPal account is konto@mass-und-gewicht.de

Alternatively the book is available as a pdf file and can be downloaded from the homepage of Maß und Gewicht by using the following link: http://shop.mass-und-gewicht.de/Beihefte/2 . Sales price is 25€. Maß und Gewicht bears the PayPal charges.

Questions may be sent to versand@mass-und-gewicht.de

'WARRANTED STEEL BUSH'D' on the Poise - E. Heeley & Co.

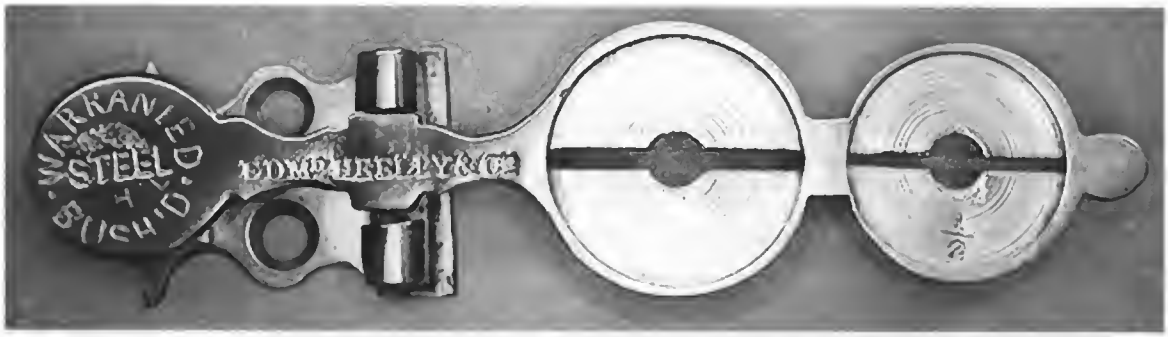
BY MICHAEL FOSTER

There is a series of mountable standard sovereign rockers with the 'WARRANTED STEEL BUSH'D' stamp found on the poise made by Edmund Heeley & Co. of Union St, Birmingham.

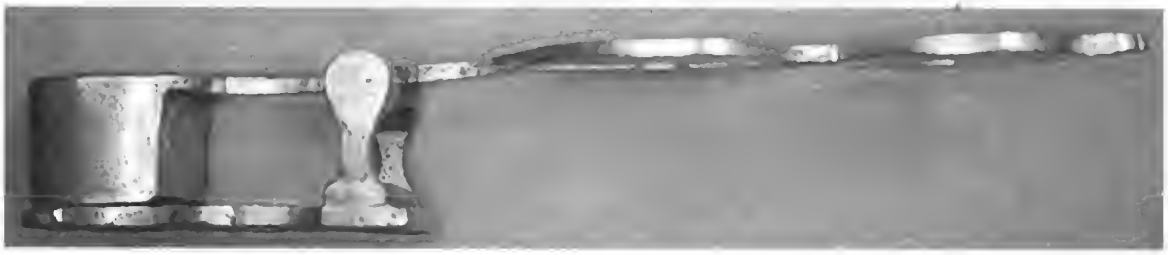
Sovereign rockers with the 'WARRANTED STEEL BUSH'D' stamp found on the poise are very rare.

D58a: Edmund Heeley & Co. WARRANTED STEEL BUSH'D

Even harder to find are the rockers with the makers' name on the beam, "EDMᴰ HEELEY & Cº" as seen on Variant 1.



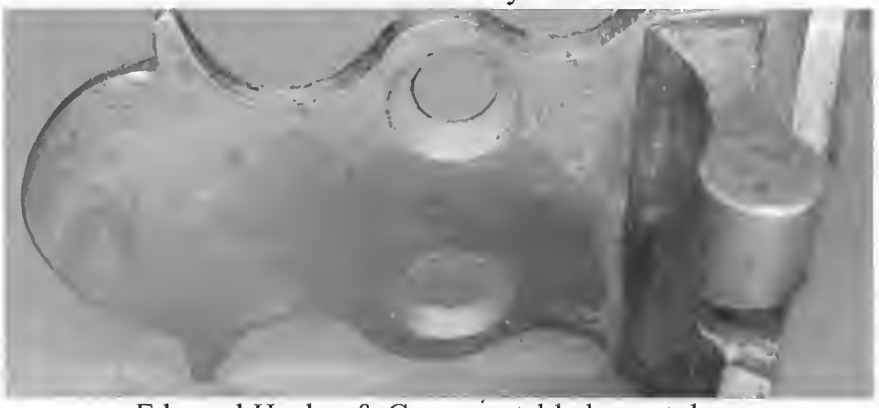
Variant 1: Edmund Heeley & Co. with full-rim platters and spatulate finial.



The beam is stamped with 'EDMᴰ HEELEY & Cº' shown in the following close-up:

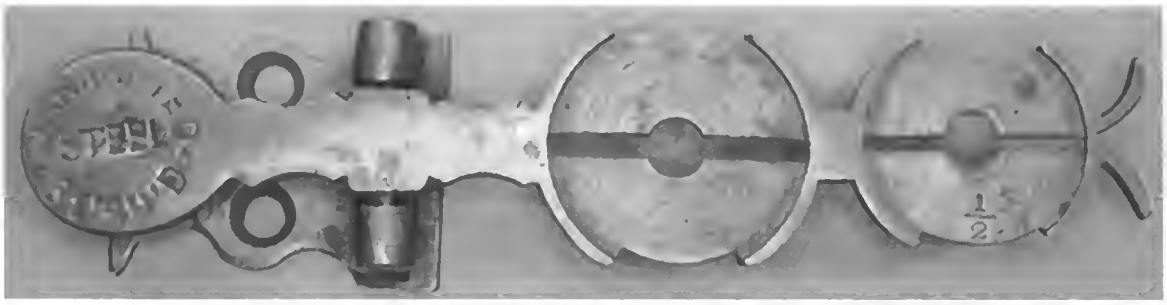
'EDMD HEELEY & Cº' stamp on beam

These rockers are found with a distinctive mountable base style:



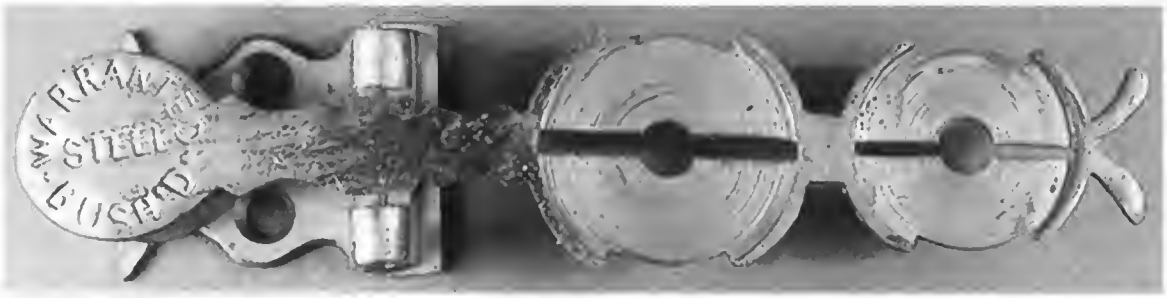
Edmund Heeley & Co. mountable base style

Later unnamed versions with just the distinguishing feature of the 'WARRANTED STEEL BUSH'D' stamp on the poise are seen in Variants 2 and 3. The spatulate finial has been changed to a two-horn finial and the platters are now notched.

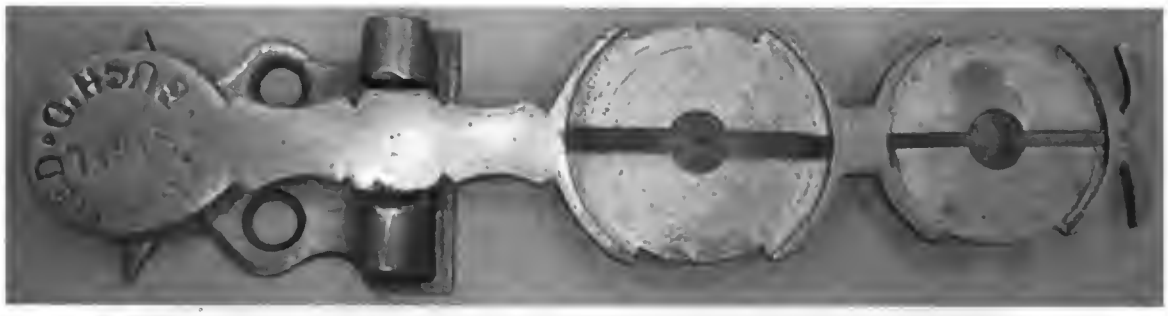


Variant 2: Edmund Heeley & Co. with notched platters and two-horn finial

The platters on Heeley rockers appear to be typically unlabelled except for the '1/2' sometimes found on the half-sovereign platter as seen in Variant 1 and 2. Variants 3a and 3b have the 'WARRANTED STEEL BUSH'D' stamp orientated right-side up or upside down to normal and both platters are blank:



Variant 3a: Edmund Heeley & Co. with blank notched platters and two-horn finial



Variant 3b: Edmund Heeley & Co. with blank notched platters and two-horn finial 'WARRANTED STEEL BUSH'D' on the poise is Upside down to normal

These rockers were typically sold in a cap-end box:

The label reads: "IMPROVED SOVEREIGN BALANCES / **WARRANTED**, / STEEL BUSHES AND KNIFE EDGES"

Edmund Heeley filed a Design Registration in June 1842, No. 1323 on a Coin Balance with a Sliding Collar to Indicate Shortage that is illustrated in Money Scales and Weights, Sheppard and Musham, No.303 on p.150.

No. 303. — Turned brass pedestal sovereign balance, rectangular straight beam (5 ins. long) stamped EDMD HEELEY & Co (Fig. 68) counterpoised at near end, with fixed circular recessed weight for the ½ sov., supported underneath by a turned pillar, a sliding collar to indicate shortage and suspender brass clip for coin:

Weights. — A circular weight which is missing to make up to I sov. to fit above named socket.

Base. — Rectangular with bracket edges.

No. 66.444. National Museum of Wales.

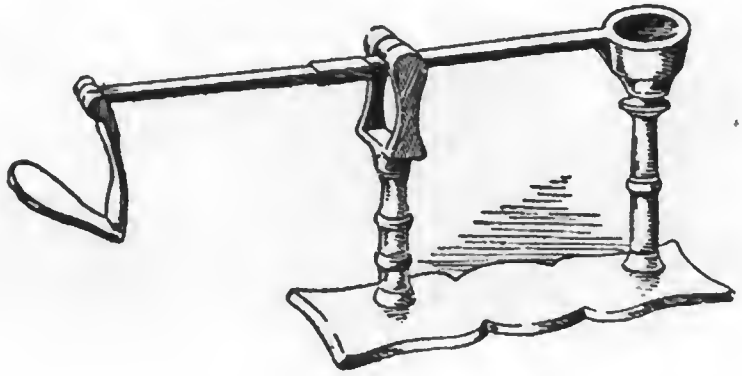


FIG. 68.

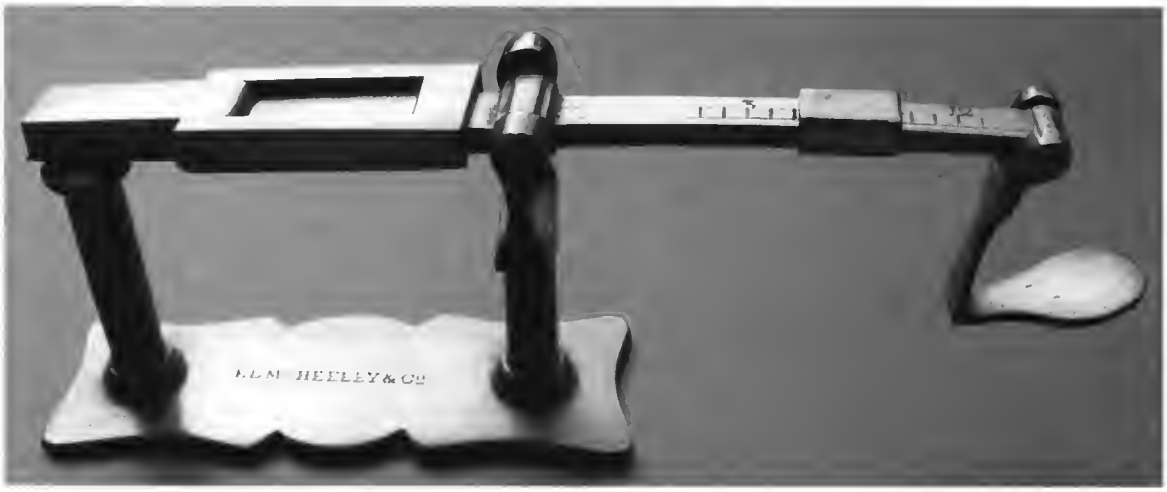
A version of this sovereign balance was sold by Franklin & Co, 20 St. Ann's Square, Manchester, and is shown below from the Brian Brass collection:

Edmund Heeley designed sovereign balance with sliding collar to indicate shortage

This balance design was improved with the addition of a turn-over weight similar to that found on the folding guinea and sovereign balances. An example from the Michael Crawforth collection with "EDMD HEELEY & CO" on the base:

'EDMD HEELEY & CO' stamp on base with turn set to check sovereigns

The beam is 117 mm long. Height 45 mm. The slide shows pennies-worth deficient.



'EDMD HEELEY & CO' stamp on base with turn set to check half-sovereigns

A search of Birmingham directories and British newspapers finds Edmund Heeley & Co, wholesale jeweller, gilt toy maker, cutler and steel pen and pencil case and holder maker, and wine importer of Union St, Birmingham, from 1830 to 1848.

Heeley's neighbour at 30 Union St. from 1828-1835 was William Broomhall, Book seller and stationer. Broomhall sold a standard sovereign rocker made for him by Thomas Simmons, with his initials 'W.B' stamped on the beam, perhaps in competition to Edmund Heeley and Co.

A second neighbour, James Belcher and Son, Book sellers, stationers, and printers, of 5 High St, Birmingham from 1823-1850, was a retailer of standard and non-standard rockers made for him by Blews, with his name 'J. BELCHER' stamped on the beam or base.

An advertisement from *Osborne's Guide to the Grand Junction, or Birmingham, Liverpool, and Manchester Railway* of 1838 provides some insight into the Heeley's business:

EDMUND HEELEY AND Co.
(FROM RICHARDS')
WHOLESALE JEWELLERS, PLATERS,
And Manufacturers of
ARGENTINA (OR MERRY'S PLATE) SPOONS, FORKS,
Pencil Cases, &c.
25, UNION STREET, BIRMINGHAM.

SILVER TABLE, DESSERT AND TEA SERVICES,
PRIZE CUPS AND COMMUNION PLATE,
SILVER KNIVES, FORKS, AND SPOONS,
Made to order.
JEWELLERY OF EVERY DESCRIPTION.
Gold and Silver Vertical and Lever Watches.
SHEFFIELD AND BIRMINGHAM PLATED GOODS.
Estimates given for Services and every Article of Plate.
GILT CHAINS, EAR-RINGS, BRACELETS, &c.
Livery Buttons, and Engraving in all its Varieties.
WATCHES, PLATE, AND JEWELLERY REPAIRED,
And Diamonds and Pearls set by experienced workmen.
BEST SHEFFIELD TABLE CUTLERY.
Argentina Table Spoons and Forks, 30s. Dessert ditto 21s. Tea 10s. to 15s. per doz.

Patronised by the Public Offices of Her Majesty's Government.

The Piracies to which E. H. & Co. have been subjected, not only in their Inventions, but in some instances by a slight orthographical variation in their name, render it imperative upon them to request purchasers will observe, that on EVERY GENUINE BOX OR CARD is printed EDMUND HEELEY & Co., and further to protect the Public from a *spurious* and *imperfect* article, they have struck their name upon every "*Patent Steel Quill Pen*," to copy which is punishable *by law*.

To prevent the occurrence of mistakes the trade is respectfully desired to use the Christian Name, as above, in their written communications.

HEELEY'S *Magnum Bonum*, or Royal *Ordnance Pen*, broad points.
HEELEY'S *Ne plus ultra* Pen, fine points.
HEELEY'S Ruby or Diamond Pen, ditto.
HEELEY'S Fine "Patent Steel Quill Pen," medium points.
HEELEY'S "Royal George" Pen, ditto

Medals of the Town Hall, Grammar School, Wesleyan Conference, Temperance and Conservative Societies, &c.
Sole Agents in Birmingham for Cook's Patent Gas-burner, without smoke.
Sole Agents for Ratcliff's Patent Universal Table Lamp, and Palmer's Candle Lamp.
d

Advertisement from Osborne's Guide to the Grand Junction Railway
Published by E.C. & W. Osborne, 1838

The following is a summary of the research and time-line information from Birmingham Directories and British newspapers for Edmund Heeley & Co.:

Harris, Heeley & Co. (E. Heeley was a partner)

1827 Partnership between Theophilus Richards, jnr. Merchant and Edmund Heeley of Birmingham, importers for French and other Ornaments, Manufacturers, &c. carrying on trade under the firm of Edmund Heeley and Co. was dissolved July 1, 1827 by mutual consent. All debts owing to and by said firm were received by George Holtham Harris and Edmund Heeley, under the firm of Harris, Heeley and Co. Reference: *Birmingham Gazette*, Monday 24 March 1828, p.4. Reference: *London Gazette*, 21 March 1828, p.566.

1828-29 Harris, Heeley & Co, Manufacturing jewellers and Gilt Toy makers, 24 Union St, Birmingham, DR#6, p.772, p.793 under Gilt Toy makers, p.797 under Jewellers-Manufacturing.

1829-30 Harris, Heeley and Co, Importers of jewellery and enamels, Jewellery and Gilt Toy manufacturers, Agents for French wine, 24 Union St, Birmingham and 212 High Holborn, London. Percussion Cap makers, 26 Union St, Birmingham and Rue St. Denis, Paris, DR#8, p.42.

Edmund Heeley, Residence, George St, Edgbaston, Birmingham, DR#8, p.45.

1830 Partnership or joint trade between George Holthan Harris and Edmund Heeley under the firm of Harris, Heeley and Co. was dissolved 17 August 1830. Reference: *London Gazette*, 31 August 1830, p.1861. Reference: *Perry's Bankrupt Gazette*, London, Saturday 11 September 1830, p.3.

Edmund Heeley & Co.

1830 Edmund Heeley bought business from George H. Harris on 23 August 1830 for the sum of £1830. Reference: *Birmingham Gazette*, Monday 30 August 1830, p.3.

1833 Edmund Heeley and Co, wholesale jewellers, gilt toy and steel pen makers, 24 Union St, Birmingham, DR#12, p.40, p.113 under Jewellers-Manufacturing, p.117 under Percussion Cap Manufacturers, p.120 under Steel Pen makers.

Edmund Heeley, Residence, George St, Edgbaston, Birmingham, DR#12, p.40.

1835 Edmund Heeley and Co, wholesale jewellers, manufacturers, wine merchants, 24 Union St, Birmingham, DR#13.

Edmund Heeley & Co, wholesale jewellers, percussion cap maker, 24 Union St, Birmingham, DR#14, p.513, p.537 under British Plate and Albata Manufacturers, p.557 under Jewellers-Manufacturing, p.563 under Percussion Cap maker, p.564 under Platers and Manufacturers of Plated articles on Steel.

1837 Edmund Heeley & Co, 24 Union St, Birmingham, DR#15, p.8 under British Plate and Albata Manufacturer, p.23 under British Plate and Albata Manufacturers, p.24 under Platers and Manufacturers of Plated articles on Steel, and 25 Union St, Birmingham, p.19 under Jewellers-Manufacturing.

1839 Edmund Heeley & Co, wholesale jewellers, medallists, spoon & fork makers, 25 Union St, Birmingham, DR#16, p.240, p.449 under Jewellers Wholesale, p.454 under Medallists.

Edmund Heeley and Co, wholesale jewellers, medallists, wine & spirit merchants, 24 Union St, Birmingham, DR#17, p. 91, p.203 under Goldsmiths & Jewellers, p.217 under Steel Pen makers.

Edmund Heeley, Commissioner of the Street, DR#17, p.227.

1842 Edmund Heeley & Co, wholesale jewellers, spoon, fork, pencil case & steel pen manufacturers, 28 Union St, Birmingham, DR#18, p.36, p.92 under Gilt Toy makers, p.97 under Jewellers (24 Union St), p.103 under Pencil Case & Pen Holder manufacturers, and p.110 under Steel Pen manufacturers (25 Union St).

1847 Edmund Heeley & Co, 38 Union St, Birmingham, DR#20, p.14 under Cutlers, p.17 under Gilt Toy mak ers and p.28 under Pencil-case and Pen Holder manufacturer (25 Union St), under Platers and Manufacturers of Plated articles on Steel (34 Union St), p.32 under Steel Pen Manufacturers (25 Union St).

1848 Notice that Edmund Heeley & Co. intend to close shop in March 1848. Reference: *Birmingham Gazette*, Monday 14 February 1848, p.3.

Edmund Heeley born in 1799, married Mary Ann Ratcliff (1806-1879) of Birmingham in 1827. They had a first daughter Mary Ratcliff Heeley in 1828, who may have died as a baby, followed by a son Dr. John Theophilus Heeley in July 1830, (named after his grandfather John Heeley and Edmund's previous partner Theophilus Richards, junior). John went on to become a doctor living in Australia until his death in 1910. Their second son Edmund Arthur Heeley was born in 1833. Arthur went into business with his father. Lastly a second daughter, Frances E. Heeley was born in 1846.

Heeley made use of the newspapers of the time to market and promote his business and other endevours. In the *Birmingham Gazette* from 1833 to 1848 there are numerous advertisements and announcements to do with Edmund Heeley & Co. covering their changes in address on Union St. and their product offerings, some of which are mentioned in the 1838 advertisement in *Osborne's Guide*.

Heeley was an early manufacturer of cutlery using the new technology of electroplating. Argentina Silver or as Edmund apparently trademarked it "Merry's Plate" was electroplated Nickel silver. The two common forms of plated silver in Britian were Sheffield plate and silverplate/electroplate.

Sheffield Plate is a cheaper substitute for sterling silver, produced by fusing sheets of silver to the top and bottom of a sheet of copper or base metal. This 'silver sandwich' was then worked into finished pieces. Silver plate or electroplate is formed when a thin layer of pure or sterling silver is deposited electrolytically on the surface of common base metals which include copper, brass, Nickel silver (an alloy of copper, zinc and nickel) and Britannia metal (a tin alloy with 5-10% antimony).

Nickel silver or German silver became popular as a base metal for silver-plated cutlery and other silverware. About 1832 a form of German silver was developed in Birmingham. By 1838, businesses in Britain were using metal deposition processes. John Wright of Birmingham, discovered that potassium cyanide was a suitable electrolyte for gold and silver electroplating. Wright's associates, George Elkington and Henry Elkington were awarded the first patents for electroplating in 1840. The Elkingtons are credited with founding the electroplating industry in Birmingham from where it spread around the world.

It seems that some time after closing his manufacturing jewellery business on Union St. in 1848, Edmund went into partnership with Charles Ratcliff his brother-in-law as Electro Platers under the firm name of Ratcliff and Co. On 1 January 1866, the Partnership, Ratcliff and Co, between Charles Ratcliff, Edmund Heeley and Edmund Arthur Heeley at Arundel St, Sheffield was mutually dissolved. All debts and liabilities owing to and by said firm were received by Edmund Heeley who continued to carry on trade with his son Edmund Arthur Heeley. Reference: *London Gazette*, March 5, 1867, p.1550 and *Perry's Bankrupt Gazette*, London, 9 March 1867, p.7-8.

Edmund Heeley himself was a highly respected member of the community, listed as President or Vice-President of the Borough of Birmingham Loan Society from 1838 to 1855, and involved with Life Insurance and Deposit companies and a variety of community and charitable endeavours including being a Commissioner of the Street.

Interestingly, in a number of these endeavours Edmund was involved with other top manufacturers of the time. Birmingham was unusual in having so many institutions run by volunteers from the manufacturing trades. Edmund died on 7 January 1871.

Edmund Heeley & Co. of Union St, Birmingham, in operation from August 1830 to March 1848, made a variety of jewellery, toys, stationery and cutlery items in addition to being the maker of the distinctive 'WARRANTED STEEL BUSH'D' standard sovereign rockers and some interesting balances with slides to indicate deficiency of the coin's value.

ISASC

EQUILIBRIUM®

QUARTERLY MAGAZINE OF THE INTERNATIONAL SOCIETY OF ANTIQUE SCALE COLLECTORS

2014 ISSUE NO. 4 PAGES 4077 - 4104

Cover Picture

One of the smallest coin operated scales manufactured was this Loboy made by The Rock-Ola Manufacturing Corporation of Chicago, Illinois. This 33" tall scale was priced at $50 in a January 1932 advertisement. By May 1932 the price was down to $35.

In August 1932 the new 44" tall Loboy took its place and was manufactured by the company for the next 15 years.

Serial numbers indicate that there were probably about 250 of these 33" scales manufactured. Made of porcelain over cast iron, known examples are blue like the one pictured here as well as green.

Bill Berning Collection.

Contents

Ottoman Dirhem Weights
Lionel Holland 4079-4085

Spanish Coin Scale Boxes Part 3: Andalusia
Ludwig Ramacher & Xisco Valles 4086-4096

Were Maker Mark Crowns on Rockers Used Elsewhere?
Michael Foster 4097-4104

ISASC
INTERNATIONAL SOCIETY OF ANTIQUE SCALE COLLECTORS

EQUILIBRIUM is published quarterly in February, May, August and November.

 ISSN: 0893-2883

Editor: Jan H. Berning, **Tel** 815.895.6328 **Fax** 815.895.6328 JHBerning@comcast.net
Associate Editor: Charley Amsbaugh **Tel** 443.952.7681 research.eggscales@comcast.net
Associate Editor: Diana Crawforth-Hitchins **Tel** 01865.763096 lehitchins@aol.com

Article submissions are preferred in MS Word with Times New Roman Font size 12.
Photos are best in 300 DPI Jpegs in a separate file with a maximum of 3 photos per Email.

Ottoman Dirhem Weights

BY LIONEL HOLLAND

To most people of the Western world, the East (both Near and Far) is a world apart – closer to the "Arabian Nights" of Ali Baba and Sinbad, than to ordinary, everyday things. Yet, when we look at the weights and measures of the Ottoman Empire, we shall find, beneath the exotic trappings, systems and practices remarkably similar to those in use for centuries in Europe and America.

The Turks were originally nomadic tribes inhabiting the steppes of Central Asia. During the early Middle Ages, they were pushed Westward by population pressures from the East. Turkish tribes, hungry for new lands, eventually took over the territory of older empires in the Near East. Most Turkish tribes became converts to Islam, and by the thirteenth century, practically the entire Middle East was under the control of one Islamic state or another (Turks to the North, Arabs further South). The Turkish states did not have a strongly centralized organization; they were more agglomerations of provinces under local governors (emirs or beys), who enjoyed greater or lesser degrees of autonomy (under a Sultan, or supreme ruler), and were always jostling and fighting one another for dominance[1].

From about 1300 onwards, a small province or beylik in North-Western Anatolia began to gain ascendancy over its neighbours. These particular Turks called themselves Osmanli, after Osman I, the founder of their ruling dynasty (Ottoman is a Westernized rendering of Osmanli). By the end of the 14th century, the Ottoman Turks had gained control of much of Anatolia, and had crossed the Bosphorus into Europe. In 1453, the Ottoman army besieged and took Byzantium itself, putting an end to an empire that had lasted more than a thousand years.

A succession of dynamic Sultans maintained a policy of expansion and conquest. By the late16th century, the Ottoman Empire (its capital being Istanbul, the former Byzantium) spanned three continents (Figure 1).

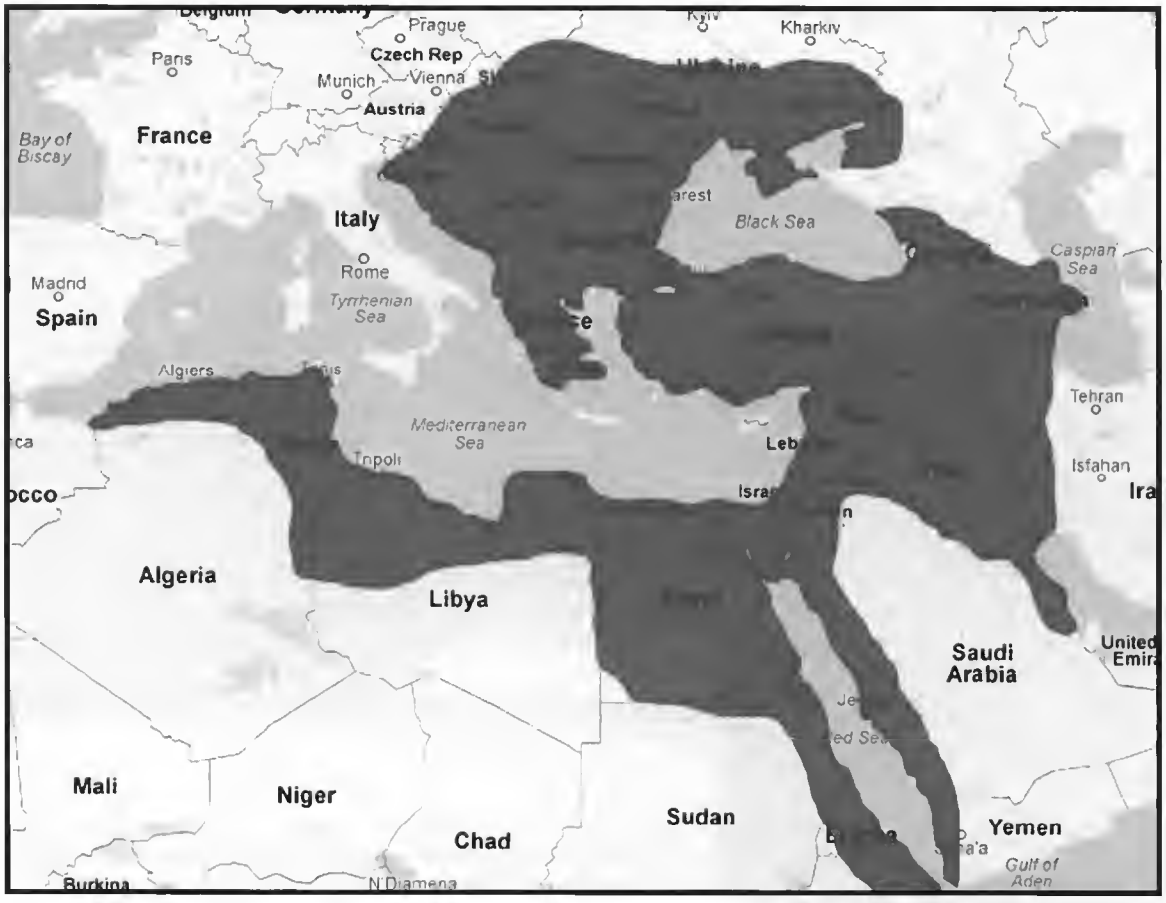


Figure 1. The Ottoman Empire at its greatest extent, ca. 1600.

From about 1600 onward, centuries of decline ensued; the end of World War 1 saw the final collapse of the Ottoman Empire, and the establishment of the Republic of Turkey, now confined mostly to Anatolia.

The Ottoman Empire included numerous nations, and encompassed an immense diversity of cultures. This diversity included weights and measures, which are what concerns us. The nomad Turks, when they used weights and measures at all, used units borrowed from more sedentary nations with whom they had contact. When they settled down, they borrowed measuring systems from conquered peoples, and sometimes modified them to suit themselves. And (like the Romans, earlier) they didn't forcibly impose their own systems onto subject peoples. As a consequence, different units of measurement were often used, in different parts of the Ottoman Empire; and even if the units had the same name, they might have quite different absolute values from one place to another, or from one time to another[2].

In earlier articles in EQM, I have described the Okka[3], an indigenous Turkish unit of weight used in commerce, and the Ratl[4], a commercial unit (equivalent to the European pound) used by the Arab nations under Turkish rule. Both of these were based on a unit called a dirham or dirhem (in Turkish, it's spelt dirhem; and since we're talking about Turkish weights, we'll stick to dirhem).

The word dirhem is derived from the Greek word drachma. The dirhem was originally a silver coin, first issued by the Sassanid rulers of Persia. At the beginning of the seventh century, Persia was conquered by the Arab armies who, at that time, overran most of the Middle East. The Arab Caliphs took over the dirhem as their unit of silver coinage, and standardized it at about 2.9 grams. In the course of time, the silver coinage of the Arabs underwent all sorts of changes and debasements, and the name dirhem became attached to a unit of weight, used in all the Muslim countries of the Middle East. It eventually came to be the definitive unit, in terms of which all other units of weight were expressed. Larger units, such as ratl, kantar, okka, were always defined in terms of so many dirhems. The Fatimid rulers of Egypt (10th-12th centuries C.E.) used a ratl (commercial pound) of 144 dirhems (12 wuqiyyeh, or ounces, of 12 dirhems each). This ratl weighed about 420-440 grams, and was still in use in Egypt in the mid-19th century, almost a thousand years later[5], based by that time on a dirhem of about 3.09 – 3.10 grams. In Southern Palestine, in the 19th and early 20th centuries, a ratl of 900 dirhems was in use; while in Northern Palestine and Syria, a ratl was equal to 800 dirhems, of about 3.2 grams each. For several centuries, the absolute mass of the official Turkish dirhem was about 3.2 grams. In more outlying parts of the Ottoman Empire, and in other parts of the Muslim world, the dirhem might be anywhere between (roughly) 2.5 and 3.5 grams, at different times and places, as noted above.

Besides being used to define other units, the dirhem in the Ottoman Empire also had a life of its own. Precious metals (in particular, silver) would be weighed in dirhems. So would costly merchandise sold in small quantities (spices, medicines, jewellery, etc.). Dirhem weights were issued in decimal series of 1, 2, 5, 10, 20, 50, 100 and 200 dirhems. There were also weights for fractions of dirhems (though I've never seen an Ottoman fractional dirhem weight, even in a book or catalogue. There can't be many survivors)[6].

Figure 2. ≺≺ One-dirhem weight (15 mm, 3.07 g) bearing the toughra (monogram) of Sultan Suleyman I The Magnificent, 1520-1566 C.E (from the Suna and İnan Kıraç Foundation, Anatolian Weights and Measures Collection, Pera Museum).

Ottoman dirhem weights come in a variety of shapes: two of the commonest are shown in Figures 3 & 4. The flat octagonal shape was used by the Ottomans for 500 years or more.

Figure 3. ⅄⅄ Octagonal dirhem weights. Left, 50 Dirhems, date illegible, middle, 10 dirhems, dated (1)279, that is 1863 C.E. & right, 5 dirhems, dated (1)247, that is 1832 C.E.

Figure 3 shows weights of 50, 10, and 5 dirhems. They are stamped (inside an oval cartouche) with the last three digits of the Islamic year's date, and with the toughra, or monogram, of the reigning Sultan. The legible dates show that these specimens were made early in the 19th century.

Another shape of weight used by the Ottomans was the beveled cube: a cube with all its eight corners sliced off, at 45 degree angles. Previous cultures (e.g. the Fatimids in Egypt – 10-11th century) are known to have used this shape occasionally, but the Ottomans went for it in a big way. Figure 4 shows four small weights of this type, decorated with geometrical shapes. Larger beveled cube weights had a handle.

Figure 4. ⅄⅄ Beveled cubes. l. to r.: 50, 20, 10, and 2 dirhems.

Other specimens sometimes have dates, and the names of Sultans, punched on them. From those, we know that this shape was also in use, concurrently with the flat octagons, for several hundred years.

The Islamic faith attaches great importance to fair trade. The (sometimes protracted) bargaining, which is a feature of Levantine commerce, is intended to ensure that both buyer and seller are fully agreed on terms, before conclusion of a transaction. Believers are enjoined by the Koran to give just weight and measure. Ottoman towns were required to appoint an inspector of weights and measures (called muhtesib, a term borrowed from Arabic), who would periodically visit the market place and check the merchants' equipment.

Figure 5. ⩓ The muhtesib at work. Note that his standard weight (on the right) is of a different (unclear) shape from the ring-shaped weight which he is checking (from *Anatolian Weights and Measures* – see below).

Special attention was paid to the measurement of grain, flour, and bread. In Istanbul, the office of muhtesib was filled by none other than the Grand Vizier himself, who would inspect the markets in person --- an indication of the importance attached to the office. Offending merchants were subjected to a variety of fines and public humiliations, including the falaka or bastinado (whipping on the soles of the bare feet), or even being nailed to their own doorpost (Figure 6).

Figure 6. ⅄⅄ The wages of fraud. (from *Anatolian Weights and Measures* – see below).

Many Ottoman weights normally bear an official mark (the toughra, or reigning sultan's monogram, or an assayer's name, or the name of a town), and a date as well. The fee for checking weights and scales, was, as in other countries, a source of income for the Government.

Besides two-pan scales, steelyards were much used in Ottoman Turkey. These, too, were required to be officially checked and stamped.

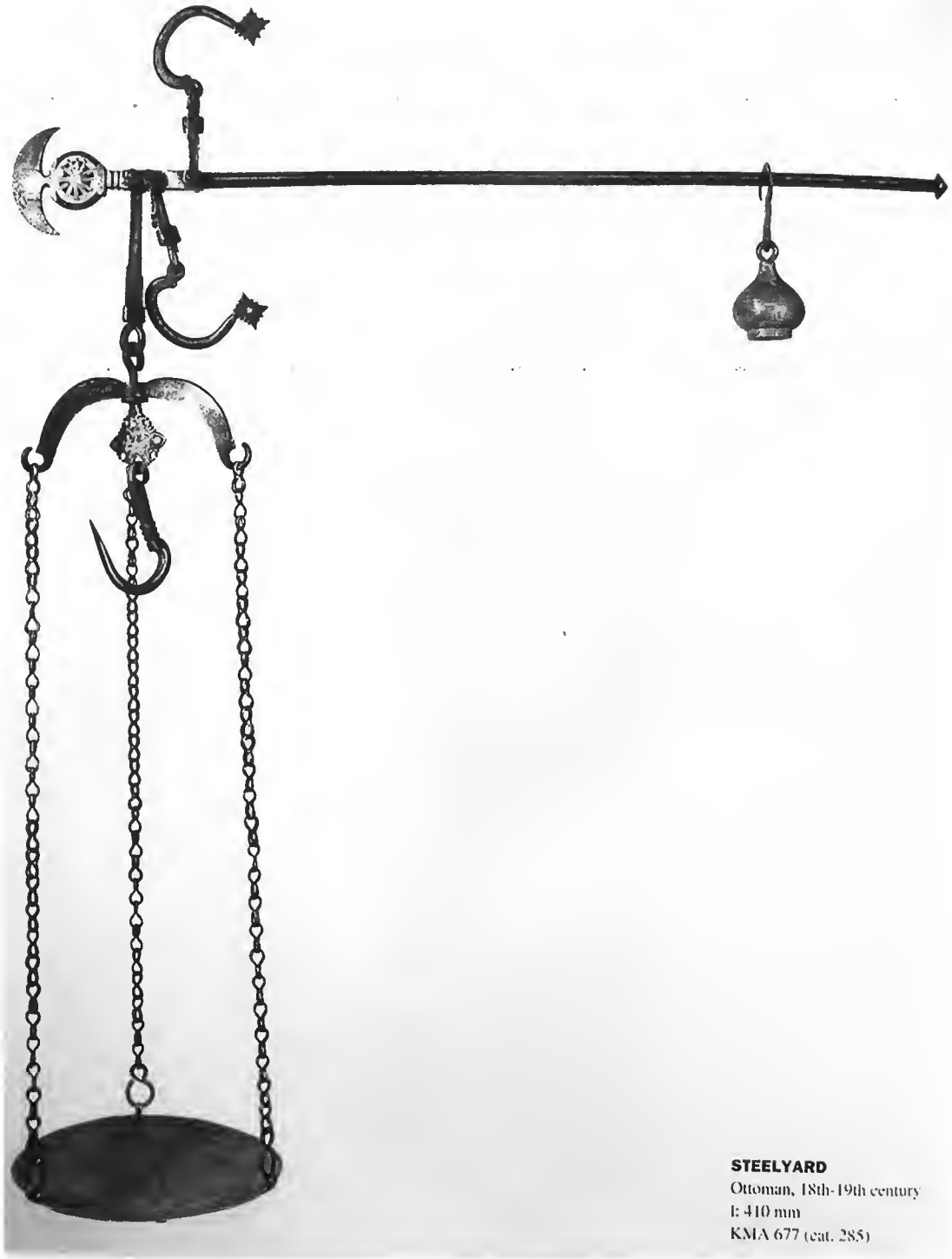


Figure 7. ⅄⅄ Steelyard (beam length 41 cm). 18-19 c. C.E. (from *Anatolian Weights and Measures*, see below).

Many Ottoman steelyards are of a remarkable elegance (Figure 7), and have clearly been made by highly skilled craftsmen --- perhaps by armourers. Bismars also were used in trade. (Figure 8). The illustration shows a bismar made of wood, being used to weigh straw. The beam would have a series of notches along its length on the underside, and would be suspended in a loop of cord, which could be moved from one notch to the other. The suspension of the bismar has been incorrectly represented by the artist, whose knowledge of measuring instruments is clearly inadequate (remember Sir Joshua Reynolds' absurd non-functional steelyard, in the hands of Justice?).

Figure 8. ≺≺ Weighing bales of straw with a bismar (from *Anatolian Weights and Measures*). Kürkman's book has several photographs of wooden bismars such as I have described. Specimens of similar bismars can be seen at the Pera Museum of the Suna and Inan Kiraç Foundation, Istanbul[7].

The eighteenth century ushered in an era of social and industrial revolution for Europe, and for the Ottoman Empire too. Nations that for centuries had been Imperial subjects, struggled for independence, especially in the Empire's European territories. Change, whether welcome or not, was everywhere. The first really precise and accurate weighings and measurements in the Ottoman empire, were carried out in the Imperial armament factories in Istanbul: they couldn't produce modern weapons without them. The metric system began increasingly to be used in a variety of scientific and industrial fields, with traditional systems remaining in everyday use alongside. In 1871, an Imperial decree declared the metric system to be the Ottoman Empire's official system of weights and measures (the official weight of the dirhem was set at 3.207 g), though this didn't immediately affect the status quo in the field to any great extent. Traditional weights and measures continued to be used alongside the metric system, right up to the dissolution of the Empire in 1919, and even after. Many of the "extremely rare Ottoman okka weights" offered on eBay at ridiculously high prices, are actually modern weights, still in use in places such as Cyprus. Some are even stamped in Greek. Caveat emptor!

Notes & References:

1. Whole libraries have been written about Turkish history. The summary given here is necessarily extremely simplified. For those interested, the *Encyclopedia of the Ottoman Empire* is freely accessible on-line

2. Halil Inalcik: *Introduction to Ottoman Metrology*. TURCICA –Revue d'Études Turques, t. XV (1983), pp. 311-348. This invaluable essay is a must read for anyone interested in Ottoman metrology. It's accessible on-line: just Google the title.

3. Okka Weights in Ottoman Palestine. *EQM* pp.1023-1025 (1987- no. 3)

4. Ratl Weights in Ottoman Palestine. *EQM* pp. 907-912 (1986 - no. 3)

5. Mahmoud Bey ("El Falaki"), *Le Système Métrique Actuel d'Égypte*. Journal Asiatique, Septième série, Tome premier (January 1873). pp.67-110. (This valuable document is accessible on-line, together with almost all of the Journal Asiatique)

6. The history of Ottoman weights and measures is told and illustrated in fascinating detail, in the book *Anatolian Weights and Measures* (2004) by Garo Kùrkman, published by AKMED, the Suna and Inan Kiraç Fundation, Istanbul.

7. The Pera Museum is a member of ISASC.

8. Lionel's metrological and numismatic publications, including his book *Weights and Weight-like Objects from Caesarea Maritima*, are accessible, and downloadable, at academia.edu.

Spanish Coin Scale Boxes, Part 3

BY LUDWIG RAMACHER & XISCO VALLES

Coin Scale Boxes from Andalusia

Sevilla

In the first two parts[1] we reported about makers of coinscale boxes and verifiers from Valencia and Barcelona. From both areas we could report about a multitude of makers and boxes. Both areas are outside the former kingdom of Castillia–Leon, which was the larger of the two kingdoms which finally formed Spain, if we just count Spanish mainland. Part 3 is about boxes from Andalusia which became part of Castilia-Leon during the requonquista, which finished exactly in 1492, the same year when Columbus arrived somewhere, where he thought was India.

Al-Andalus as it was named by the Arabs which had conquered nearly all Spain centuries ago and formed cities like Granada, Cordoba and Sevilla with impressive buildings. The history of weighing coins started already with those Arabs, but this is another story, not to be told here.[2] Due to the requonquista, Andalusia became a part of the kingdom Castilia-Leon. Sevilla played a prominent role in what the Europeans call the discovery of the Americas due to the fact that the town had a safe harbour at the Guadalquivir from which the sea was easily reachable at those times.

Sevilla therefore became not just an important harbour for Castillia for those journeys and later the trade with the new colonies, but the only one, as it got the monopoly for the trade with the Indies[3] as the Colonies were called for centuries. To control this trade the *Casa de Contratacion* was founded in 1503, which controlled the trade for the Spanish kings, and took 20% on all goods forced to be placed there.

Coin weights and coin scale boxes of Spanish origin from Andalusia we know only since the 18th century, although there should have been makers of at least weights since the 16th century at minimum[4], as shown in the following table.

Castro, Antonio	Maestro de hacer pesos[5]	about 1560
Vera, Francisco de	Maestro de hacer pesos	about 1560
Ortiz, Hernando	Maestro de hacer pesos	1580-1634
Hernando, Lorenzo	Maestro de hacer pesos	about 1598
Vargus, Machuca	Maestro de hacer pesos	about 1656
Miguel, Pedro	Constructor de pesos; locksmith, gunsmith	born about 1710 -1781
Martinez, Joseph	Constructor de pesos; clock maker	1795, 1816?, 1826
Marolino, Carlos	Constructor de pesos	about 1840/50

The first maker of boxes we have information about is Pedro Miguel Guerrero, and he seems to have been a really remarkable person, the information available about him is quite enourmos compared to any of the makers following.

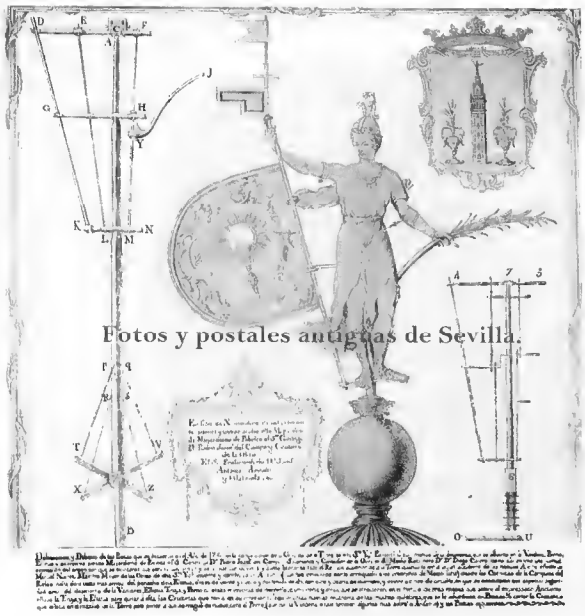


Figure 1. ≺≺ Drawing of the figure on top of the Giralda by Pedro Miguel.

He was so famous in his times for his profession, that he was called *el de los pesos*. One source claims, that he was the first maker of all kinds of weights in Seville, which before him, had to be purchased from foreign countries[6]. That is strange as another quite reliable source names other people as weight-makers before him, but analyzing the timing in the table there seems to be an interruption of at least a century, that may have lead to this impression.

Pedro Miguel was a cerrajero (locksmith) and armero (gun-smith) by profession and among his professional works is nothing less than the figure on top of the Giralda[7] bell tower of the cathedral, one of Seville's most important symbols. He must have had unusually good mathematical skills for his time[8] and is reported to have been a mathematics teacher for students in his house. He survived pneumonia twice, sources claim that this may have been because he loved to drink strong liquors[9]. At the end of his life he received a pension of 800 ducados, probably from the casa de moneda (the Mint). Miguel was born about 1710, so he should have been active from about 1740. The earliest boxes we know by dates actually are from 1769, so there is place for further discoveries.

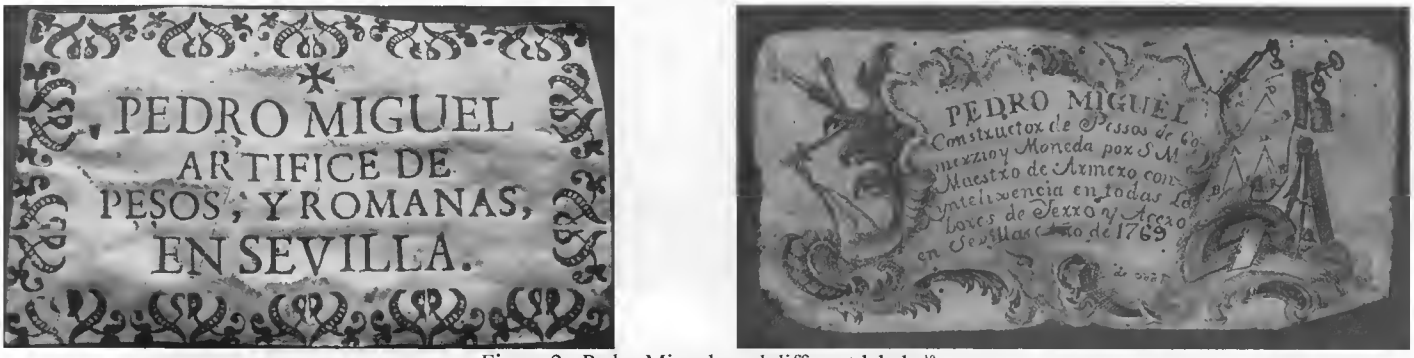


Figure 2. Pedro Miguel used different labels.[10]

The box label on the right reads PEDRO MIGUEL, *Constructor de Peseos de Commercio y Moneda por S.M. Maestro de Armero con inteligencia en todas labores de Ierra y Acero en Sevilla Ano de 1769.* Translation: *Maker of Weights for Commerce & Money, by S.M. Master Gunsmith with skills in all Kinds of Steel work in Seville year of 1769.*

We know a few boxes by him that have some rather unusual features compared with other boxes from Spain. Some of the boxes are covered by shagreen, not known from any other area in Spain. Inside they have green velvet, the holders for the coinweights being round with a core of cardboard and also covered by velvet. Usually four round coinweights[11] made on a lathe are found, for the gold and silver coins of those times, plus some smaller coinweights or fractionals.

Figure 3 AA A box by Pedro Miguel fully described in EQM p. 2995 with a third type of label.

The balances are very nicely made from steel of good quality and with a lantern sight-hole in the shears. This type of balances seem to be typical for Seville. Those cases we know from pictures with a different type of balance show marks of Valencia or Madrid, so most are probably replacements.

We will try to solve the question of why the boxes from Seville were so different from those of the rest of Spain, at the end of the article.

About José Martinez much less is known, beside the fact that he was a clock-maker, and is reported to have made, together with Antonio Deschamps, another clock-maker from Seville, the two clocks for the towers of San Marcos and San Lorenzo. They were made in 1795, the box we know for sure is from 1826. Although made of wood, inside it keeps the features which seem typical for Seville, the shears of the balance in form of a lantern, and the holders for the weights in round form covered in velvet. A special holder for fractional weights is of a form different from other examples.

Figure 4. ⅄⅄ One of the probably two known boxes from José Martinez.[12]
Label Translation : *D. JOSÉ MARTINEZ, Weight Maker S. M. authorised by the Royal Mint with skill in all iron and steel work, Seville, Anno 1826.*

About Carlos Marolino, the maker of the following box we know even less. Again the balance and the box follow principally the style of Seville. As the box contains only four holders for weights, it should have been made before 1854, when the piece of 5 Duros (100 Reales) was introduced. Interestingly a possibility to check this coin was added in the form of a gauge.

Figure 5. ⅄⅄ The box and balance made by Carlos Marolino. Note the oblong guage made for the 5 Duros (100 Reales).

Figure 6. ⅄⅄ This is the only box know by Carlos Marolino so far.
Translation: CARLOS MAROLINO, Maker and Assayer by SM of Gold & Silver Currency for Spain and the Indies.

In figure 7 we include a box which has a label saying that it was made by Manuel José Fernandez. The pans are both marked JMF. He is thought to have made the box as well as the balance. It is so similar to those described here, that we would assume it to be from Seville, too. But, as the weights show an unidentified mark in form of a flower and especially the label is different in that it explicitly describes the rules for controlling the coins, that we can not exclude fully, that it may come from another town in Andalusia. Further information about Fernandez has not yet been found.

Figure 7. ⩓ Surely this scale is from the area, but is it from Seville?

The box in figure 8 has no label any more but after the types shown above, it seems clear that it is also from Seville and most probably made after 1854, as it has five holders for coinweights.

Figure 8. ⩚⩚ Unknown maker, as the label is missing, but it is clearly from Seville

To prove that there are no rules without exceptions, we also show the box of figure 9. It is quite different, although the balance (a very fine example of its type) follows the Sevillian tradition, and there is a velvet inliner in the wooden holders. The pendant is exceptionally large and decorative. The weights are marked HOR/TYZ. Whether it is another box by Pedro Miguel or by another, still unknown, maker is a remaining riddle.

Figure 9. ⩓⩓ This is possibly the earliest example.

To see where some of the features of the Sevillean boxes derive from, it is worth going back to the article *From Isaac Newton to Blackbeard*[13]. It looks very obvious that those boxes made in early 18th-century London were the models used in Seville subsequently. We would say that all parts of all the pieces shown in this article are fully made in Seville, but we remain ready for any surprise.

At least since about the 15th century, the duty to control weights made of brass used to weigh gold, silver, spices, seeds, medicine and coins was given to the *Hermandad de San Eligio de los artistos plateros* the Brotherhood of the Silversmiths in Seville. This was confirmed several times by royal deerees. By law it was regulated how often these weights had to be verified (every four months), what the cost of a verification was (2 reales at eertain times) and how frequently the verifier had to be eleeted by the silversmiths (probably every five years). The tax for controlling the weights in Seville seems to have been an important income for the crown.

On coin weights from Seville the marks of several verifiers (marcador de pesas y pesos) have been found:
A/PAR/ICIO; AP/CIO; RCIO: should be José Aparicio Barron who was nominated as verifier for five years in 1760
GA/LAN: found in a cup weight, 1805, not yet identified
GUZ/MAN: Possibly José Guzman, second half of 18th century
HOR/TYZ; OTZ: said to be José Ortiz verifier in Seville between 1731 and 1737?
A°PALOMINO: not yet identified whether Senior or Junior Antonio Palomino, 1816
F.PALOMINO: not yet identified, second half of 19th century

In addition there is typically a tower, sometimes struck twice, the Giralda as symbol of the town of Seville. The mark HOR/TYZ is especially widespread.

Granada

Granada was the town and area which stayed Muslim for the longest period, so it is no wonder that the city has some of the most beautiful buildings from that period. After the Reconquest the town lost most of its important economic basis, and the intolerant politics of the Castillian kings finally lead to the fact that nearly all Jewish and Muslim inhabitants left the town and also Spain finally.

From Granada we know actually just two boxes. We assume that they are from Granada, because they look different from the boxes made in Sevilla, Valencia, Barcelona and Madrid. Neither has a label of a maker, but both clearly show on the weights the mark of a grenadine, the symbol of the town Granada. Both boxes are from fruit wood, the balances show typical Spanish features.

Figure 10. The boxes from Granada are quite different.

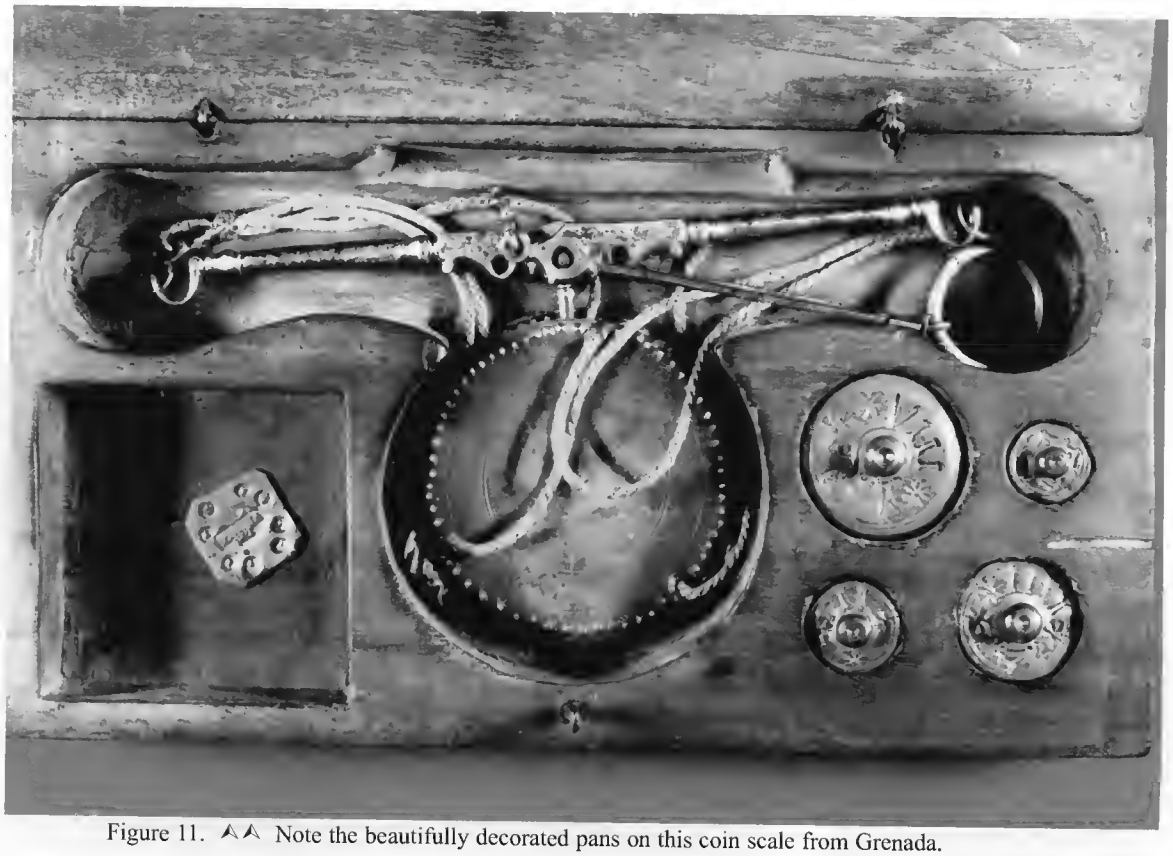


Figure 11. ⅄⅄ Note the beautifully decorated pans on this coin scale from Grenada.

One we think was produced about 1763. The maker of the box is unknown, but the weights have several marks. Beside the value in Reales, they show a cartouche including FY (standing for Fernando and Ysabel, the catholic monarchs), the symbol for the town, a 63 standing for 1763 and the name Ocana. Antonio Ocana is a known silversmith working in Granada in 1762. As he was obviously the verifier of these weights, he is most probably not the maker.

The other one could be even older, if we take into account the style of the pans and of the coin weights. The fractional weight bears the mark LA/VERNIA, which we could not yet identify. It is difficult to say if it is originally part of the box.

Cadiz

Cadiz replaced Seville as a harbour for the Americas, when shipping the Guadalquivir started to get difficult. The fairy tale is that the town is founded by Hercules, who knows? The Phoenicians were the first settlers making it probably the oldest West European town still existing.

From Cadiz we know the following boxes:

Figure 12 shows a box made by Rafael Nato, a locksmith working at calle la zanja 28 in Cadiz, *Fiel contraste de pesos y medidas* (Translation: *Tested by Weights & Measures*). The box must be after 1854 as it has a weight for 5 Duro piece. It seems to be from the 1860s because on the label there is a reference to a gold medal from an exposition and 186x, the last digit missing.

The weights and the balance look quite modern, but the balance also has the lantern form. In this case the balance is completely made of brass.

About the last one we can not say for sure that it was produced in Cadiz, as again the label is missing, but definitively it was used and verified there. The pans of the balance and some of the weights show a mark G°/QUINTANA and the town mark for Cadiz which is Hercules bearing two lions and 1868. The deep blue colour for the strings is also quite unusual.

Notes & References:

1. EQM p 3799 and EQM 3883

2. See a website full of information and nice pictures:
http://andalustonegawa.50g.com/Weights.html

3. In Portugal the Spanish Americas were called Peru. Therefore we always have at Christmas a "peru" or turkey as a main course.

4. Ensayo de un diccionario de los artifices que en Sevilla desde el sigle XIII al XVIII inclusive, José Gostoso y Perez, Sevilla, 1900 ; fully available via internet

5. Master of making weights/constructor of weights.

6. Discurso politico economico, sobre la influencoa de los gremios en el estado, 1776, Guatemala.

7. The Giralda is now the belltower of the cathedral of Seville in which the tomb of Columbus lies, but was originally the minaret of the central mosque of Seville.

8. Mercurio de Espana

9. Memorias académicas dela Real Sociedad de Medicina y demas Ciencias..1772

10. Constructor de peseos de Commercio y Moneda por S.M. Maestro de Armero con inteligencia en todas labores de Ierra y Acero en Sevilla, 1769.

11. The weights have a mass of 27,06, 13,53, 6,76 and 3,38 gr and were used to control the standard gold and silver coins of Spain of these times, however they were called. After 1854, a 5 Duos/100 Reales piece was introduced by Isabella II with 8,54 gr.

12. Picture taken from *Catálogo de la colleccion histórica de instrumentos cientificos del Museo de la Farmacia Hispana de la Facultad de Farmacia de Madrid* , Madrid 2003. The second box is without label but is marked 816, it should therefore be from the time of Martinez. It is marked by Antonio Palomino and the coin-weights seem to have also a mark for Granada.

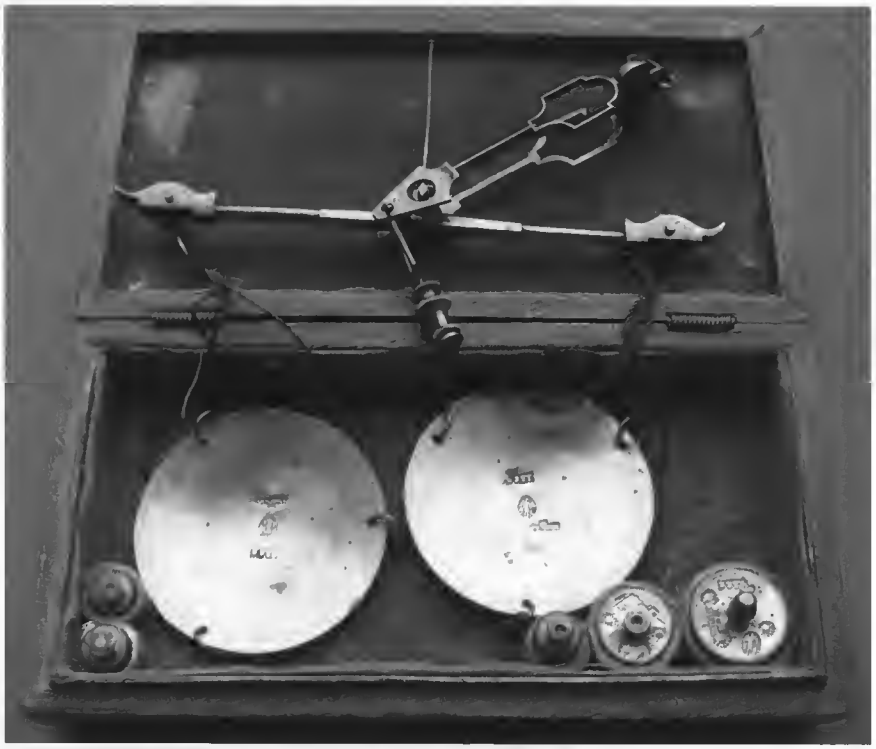
13. EQM 3575

Acknowledgements:

We have to thank Diana Crawthorth Hitchins, Pedro Martinez, Carlos Riestra, Günter Unshelm and Guido Zavattoni for the use of photos.

Figure 12. ⩓⩓ A more modern box from Cadiz.

Figure 13. ⩔⩔ This scale was verified in Cadiz, but was it made in Seville?



Were Maker Mark Crowns on Rockers Used Elsewhere?

BY MICHAEL FOSTER

If crown stamps were an early form of Trademark used by rocker manufacturers to identify their rockers, wouldn't they be used on other products of the makers in the coin testing and counterfeit detection market?

The answer to this question is yes. There are examples of their use on weights that were manufactured by some of the rocker makers. The author has documented several examples to date that follow.

Thomas Pyke (1773-1811)

One of the first rocker Crown stamp users was Thomas Pyke (successor to *Street and Pyke*). One version of his mark, a Crown on an incuse-field GR, is seen on the poise of a moidore rocker: along with his name 'T.PYKE' and business location 'B.WATER'.

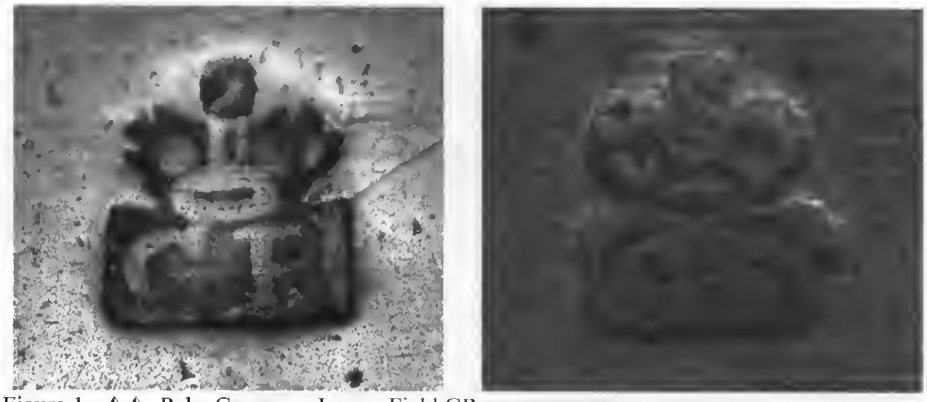


Figure 1. ⩓⩓ Pyke Crown on Incuse-Field GR.

Figure 2. ⩓⩓ Moidore 'T.PYKE / B.WATER' on poise.

Figure 3. ⩓⩓ Moidore rocker made by T. Pyke of Bridgwater.

This same crown is found on a coin weight for the Guinea issued in 1775 to the New Standard weight of 5DW:8G by Street and Pyke:

Figure 4. ⩓⩓ Street and Pyke New Standard Guinea weight, 5:8 with Crown on Incuse-Field GR.

A number of Acts dealing with Light Coin were legislated between 1773 and 1775. The most effective feature of the Acts was the re-introduction of a "Least Current Weight" for gold coin in circulation. In 1774 the guinea was valued at 21 Shillings for a Least Current Weight of 5 dwt 8 grains.

CW - Callingwood Ward (1785-1818)

There is a second early money scale maker who used a Crown stamp on his coin weights for Moidores and Guineas this is CW, Collingwood Ward. A scale beam, money scale, gilt and steel toy maker of Birmingham with Directory listings from 1785 to 1818. Reference: The Crawforth Index.

C. Ward used his unique Crown stamp as a maker mark with the letters GR for George III:

Figure 5. AA G-Crown-R Collingwood Ward.

Figure 6. AA Crowned CW Collingwood Ward.

Figure 7a. AA G-Crown-R / A /Moidore / *

Figure 7b. AA 8 / 27 / Crowned CW

Figure 8a. ⩓⩓
JD / 10.6 / Crowned CW.

Figure 8b. ⩓⩓
G-Crown-R/ HALF / A / GUINEA /*

The author has currently not found examples of these maker marks on a 'CW' or 'C. WARD' marked scale beam or money scales. Perhaps the reader has seen one?

William Blews and Son(s) (1828-1870)

The Blews Type 3 crowned V pseudo-verification mark was used during the reign of Victoria (1837-1901):

Figure 9. ⩓⩓ Blews Type 3 Crowned V.

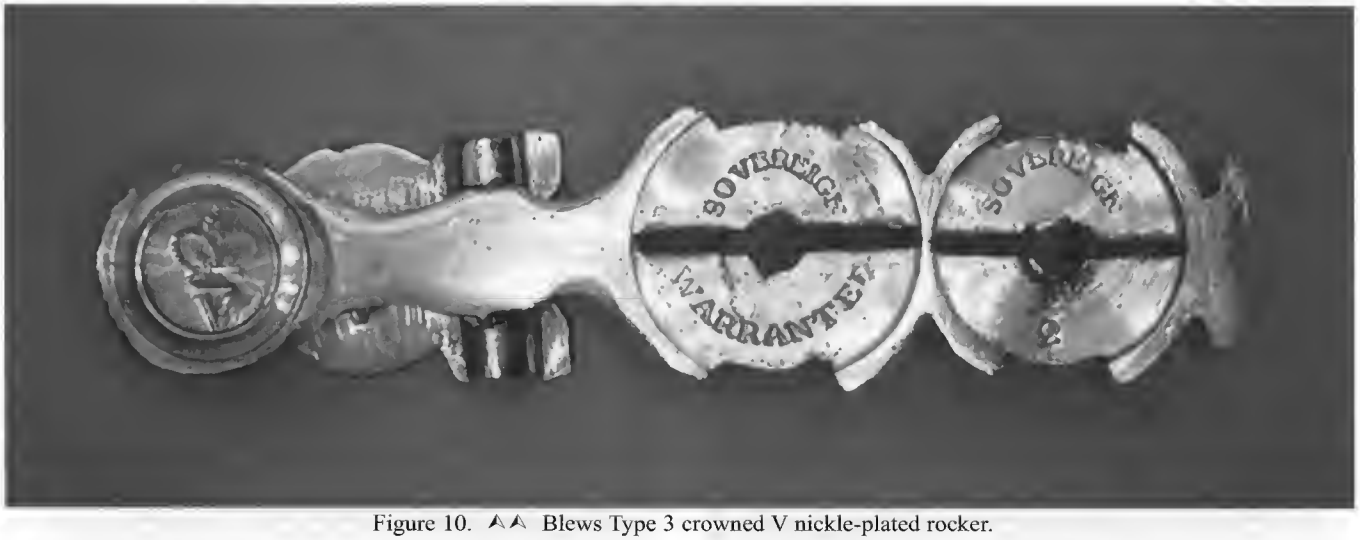


Figure 10. ⩓⩓ Blews Type 3 crowned V nickle-plated rocker.

The Blews Type 3 crowned V maker mark is also found on sovereign and half-sovereign coin weights:

Figure 11. ⩓⩓ Type 3 Crowned V on Sovereign coin weights with the date '1842'.

The year 1842 was significant because the Royal Mint issued a warning to the public to weigh all gold coins and produced a Royal Mint set of sovereign and half sovereign weights dated 1842 that were widely used by scale makers. All light gold coin was being withdrawn from circulation and could be exchanged during the year.

HARPER (1815-1835)

The dominant feature on all named and unnamed Harper rockers is the Crowned GR maker mark, found on the poise. The Crowned GR limits the years of manufacture to the reign of George III (1760-1820) and George IV (1820-1830).

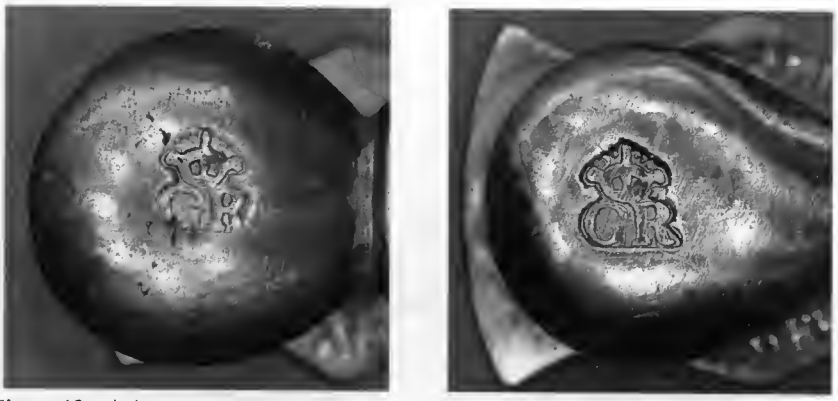


Figure 12. ⩓⩓ Harper Crowned GR.

Figure 13. ⩓⩓ 'HARPER' on the beam of rocker with Crowned GR on the poise.

There is a newly documented find relating to Harper; the discovery of the Harper Crowned GR, maker mark on the knob top of a half-sovereign weight:

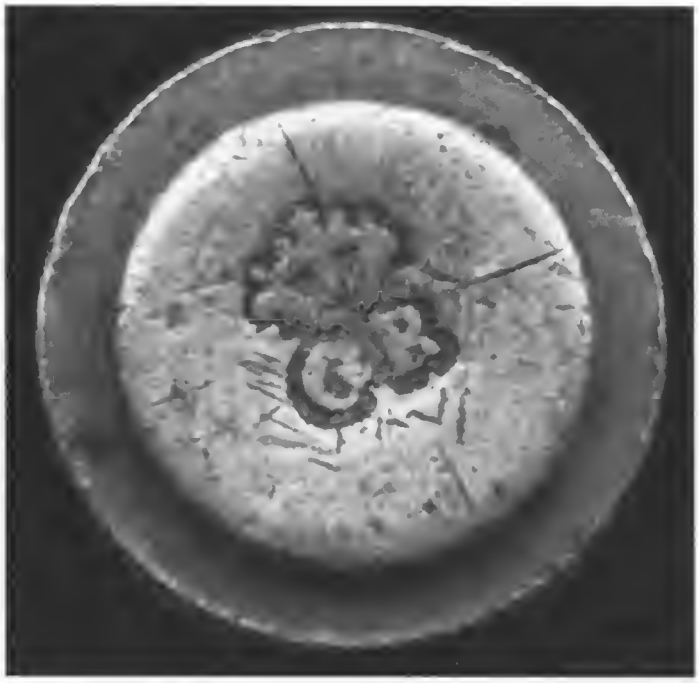


Figure 14. ⩓⩓ Harper Crowned GR on Half-Sovereign weight.

William Tabberer, Junior (1835-1850)

In 1842 William Tabberer, Junior was making rockers with the Crowned 1842 mark.

Figure 15. ⩓⩓ Crowned 1842 WT Type 4 Miniature Crown.

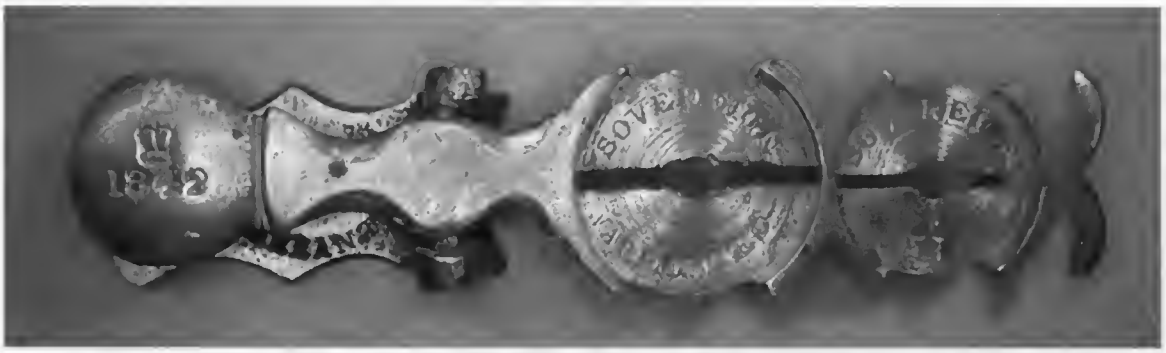


Figure 16. ⩓⩓ WT Type 4 Crowned 1842 on poise.

There is a newly documented find relating to William Tabberer, Junior. The discovery of the Tabberer Crowned 1842 maker mark on a set of sovereign weights from a scale with a brass beam, set in a Tinned box:

Figure 17. ⩓⩔ William Tabberer, Junior Crowned 1842 on Guinea and Sovereign weights.

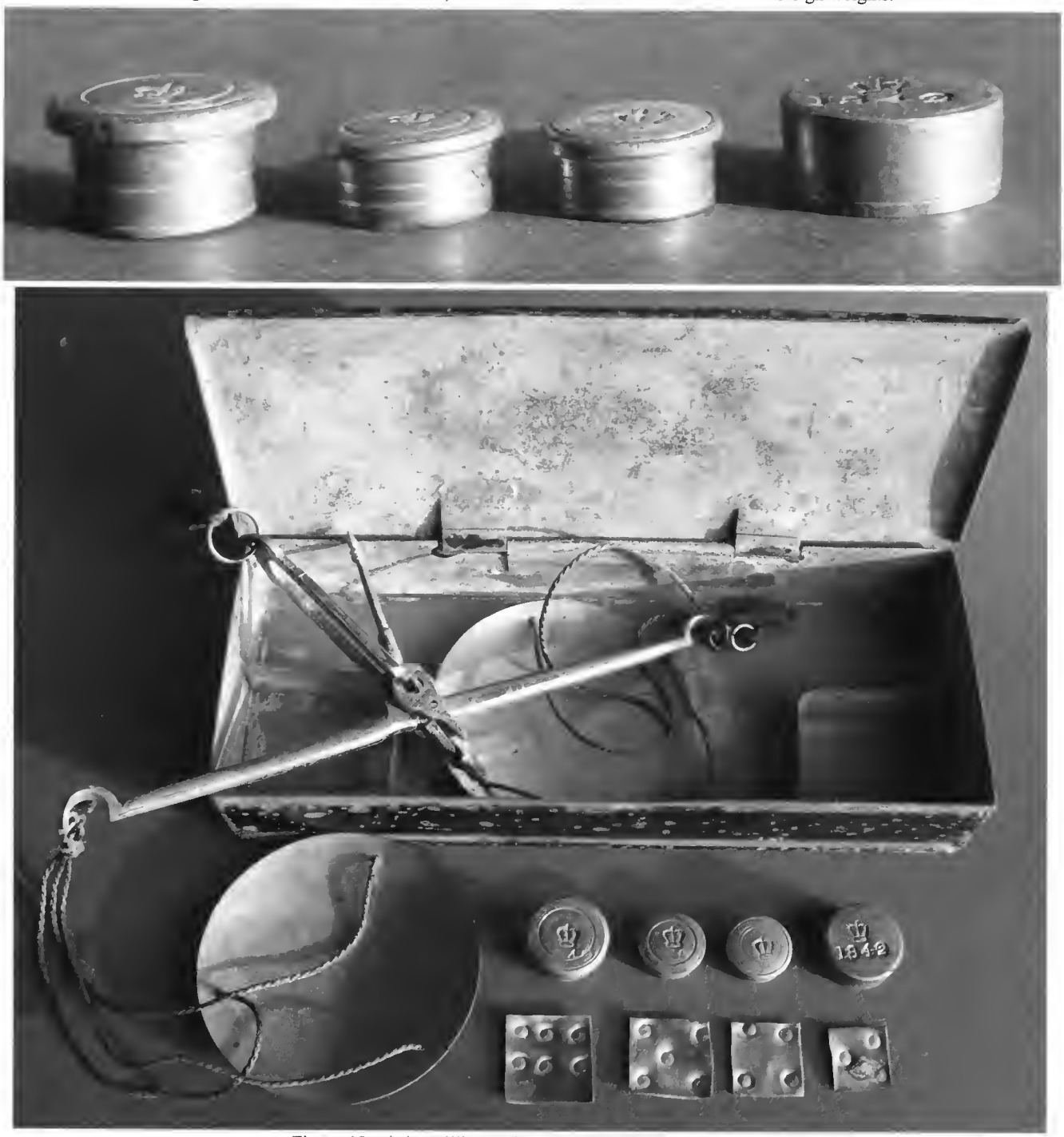


Figure 18. ⩓⩓ William Tabberer, Junior brass pan scale set.

TAYLOR - Taylor(s) and Perry? (1818-1850)

There is a 1 oz Avoir weight (Diameter 28 mm) stamped with a Crowned VR and the label 'M OF S'. 'M OF S' is the Manor of Stockport, Cheshire.

Figure 19. ⩓⩓ 1 oz. Avoir weight with Crowned VR.

Figure 20. ⩓⩓ Taylor Type 4? Crowned VR.

This Crowned VR, is possibly a Taylor Crowned VR and part of a series of very similar Crowns with GR, and WR:

Figure 21. ⩓⩓ Taylor Type 2. Crowned GR.

Figure 22. Taylor Type 3. Crowned WR.

These crowns have the same top structure which is only seen on 'TAYLOR' and 'WT' (William Tabberer) rockers. The Crowned GR and WR are found on rockers linked to 'TAYLOR' on the poise and base rockers.

My candidate TAYLOR is Taylor(s) and Perry, Newhall St, Birmingham (1818-1850) and 2 Bouverie St, Fleet St, London (1818-1839), Gilt toy makers, jewellers, silversmiths and standard rocker makers. They were in business through the reigns of George III, George IV, William IV and Victoria.

It is possible that this weight was made in Birmingham by Taylor and Perry.

The author believes there are more examples of the rocker crown maker marks on coin weights out there waiting to be found. Take a look at your weights.